

Section 7 Results of Fieldwork

7.1 Results of Pedestrian Inspection

The AISP Section 7.6.2 specifies pedestrian inspection for the purpose of the “identification and documentation of surface archaeological cultural resources” (Hammatt and Shideler 2011:122). Pedestrian surveys were conducted for the AISP and again for the AIS in February 2013. Although the field inspections did not identify any archaeological cultural resources they did inform the AIS process by providing an overview of geographic setting, topography, and potential investigation constraints (for example, in-use roadways, existing utilities, and trees that could be damaged by excavation). The pedestrian inspection provided a useful overview of the Airport Section 3 study area. Figure 30 and Figure 31 show the pedestrian inspection survey area in relation to the individual test excavations.

In general, the field inspection showed how heavily impacted the project corridor has been by previous road infrastructure work. The vicinity of where Kamehameha Highway crosses Hālawā Stream (south of the intersection of Kamehameha Highway and Kalaloa Street/Arizona Memorial Place, Figure 32) has been significantly impacted by recent road and bridge reconstruction, and the landscaping is getting re-established (Figure 33). Some areas show significant sculpting of the land surface, but it is not always clear how much of the land has been filled and how much of the land has been “cut”(Figure 34).

Two significant fingers of rock land with little soil development (Figure 36 and Figure 37) bracket a small swale area of relatively fertile Hanalei silty clay (see Figure 5, Figure 38 & Figure 39) in the immediate vicinity of Kamehameha Highway and Radford Drive. The Pearl Harbor Naval Base Station lies in a “bay” of these fertile Hanalei silty clay soils between these rockland outcrop ridges.

In the vicinity of Center Drive, Kamehameha Highway ascends a significant rise (Figure 40). The stretch between the Hickam (Joint Base Pearl Harbor Hickam) western entrance and Honolulu International Airport is at the confluence among the various on-ramps and off-ramps of the H-1 Freeway, Kamehameha Highway, and Nimitz Highway (Figure 41 to Figure 44). The corridor approaches Honolulu International Airport heading east on the south side of Nimitz Highway (Figure 45) and then heads south on Aolele Street (Figure 46) and then turns southeast just *makai* of the Airport Post Office (Figure 47) and north of the Lei Stands (Figure 48).

The Honolulu International Airport Station, on the southeast corner of the intersection of Ala Auana Street and Ala Onaona Street, is to be located to the north and east of the interisland terminals and north of the overseas terminal. There are two proposed station locations, both east of the lei stands, an initially proposed northern location (Figure 49) and an alternate station location 60 m to the south (Figure 50). The route then continues east along Aolele Street (Figure 51 and Figure 52). The route then crosses *mauka* over the drainage canal, warehouses, and parking, continuing east on the *makai* side of Ualena Street (Figure 52 to Figure 54). The Lagoon Drive Station is located just east of Lagoon Drive (Figure 55 and Figure 56).

The route continues east along (southern) Waiwai Loop, crossing over a light industrial area of warehouse-like buildings (Figure 57 and Figure 58) to Ke‘ehi Lagoon Park. The route

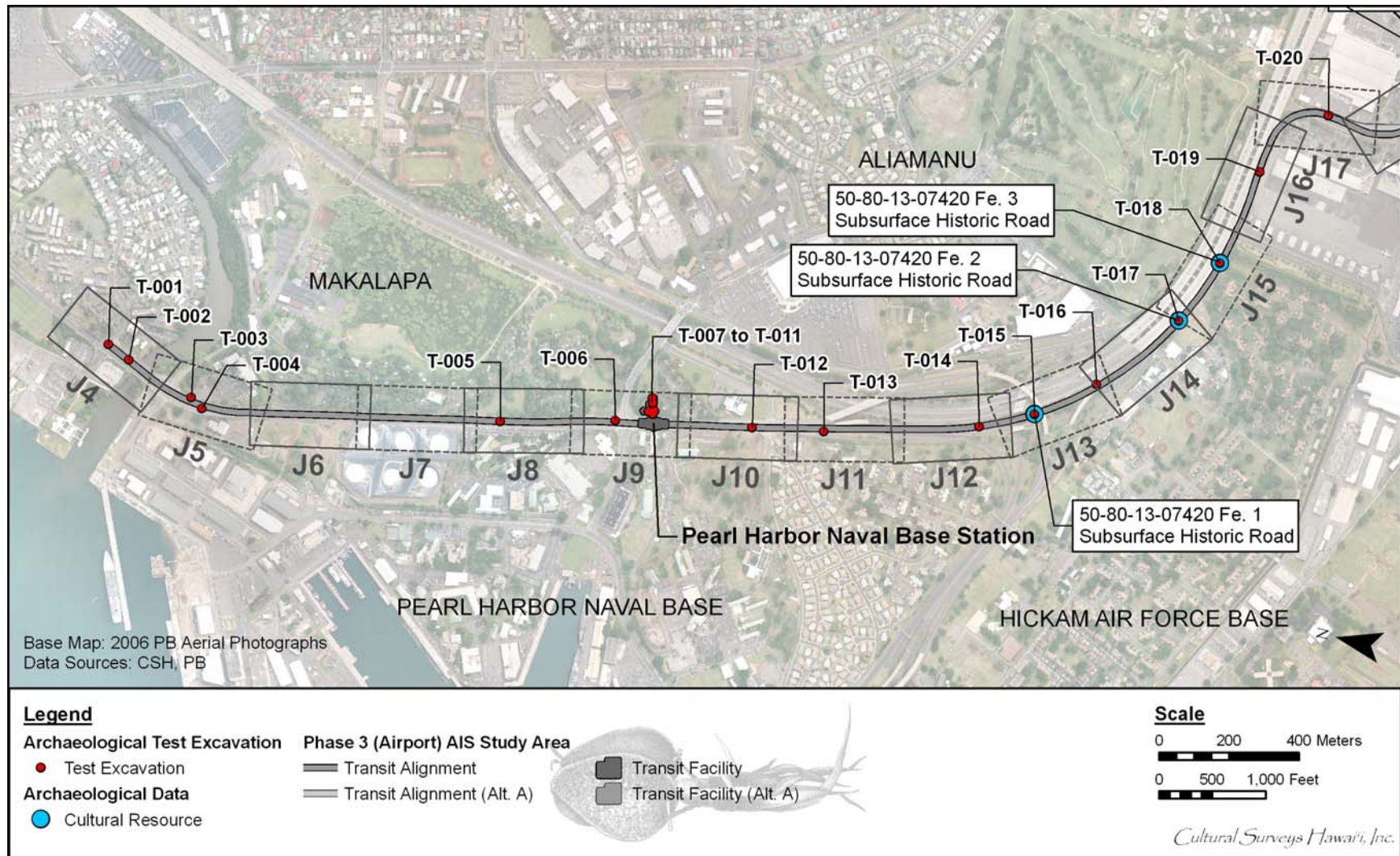


Figure 30. Pedestrian inspection survey area and overall test excavation map, north half of study area, showing the location of Test Excavation 1 through Test Excavation 20. Note: J4 to J17 represent boundaries of smaller study area segments

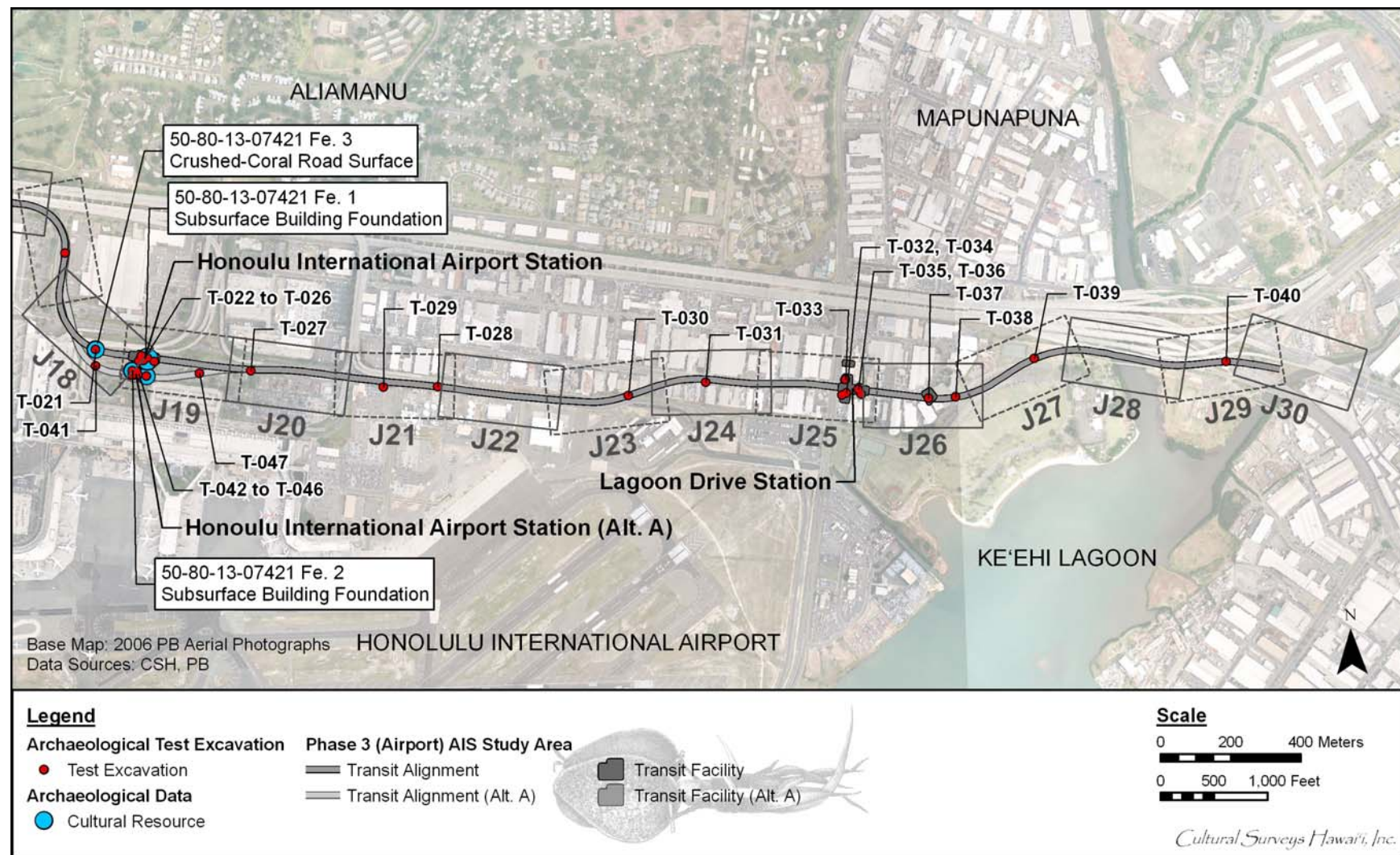


Figure 31. Pedestrian inspection survey area and overall test excavation location map, east half of study area, showing the location of Test Excavation 21 through Test Excavation 47. Note: J18 to J30 represent boundaries smaller study area segments

traverses the north portion of Ke'ehi Lagoon Park (Figure 59 and Figure 60), crossing Senator Dan K. Inouye Drive, where it meets Nimitz Highway, and then paralleling the *makai* side of Nimitz Highway and crossing Moanalua Stream. Between Moanalua Stream and Kalihi Stream the route threads over various ramps of Nimitz Highway (Figure 61), rejoining Kamehameha Highway at Kalihi Stream.



Figure 32. General view of T-001 (column foundation) vicinity, just west of LCA 2131) at the intersection of Kamehameha Hwy. and Kalaloe St./Arizona Memorial Place, view to northwest



Figure 33. General view of T-002 (column foundation) in landscaped area at right of guardrail on the north side of Hālawā Stream, view to southwest



Figure 34. General view of T-003 (column foundation) vicinity on the east side of Kamehameha Highway, just south of Hālawā Drive, view to southwest



Figure 35. General view of T-004 (column foundation) vicinity in Kamehameha Highway, south of Hālawā Drive, view to south



Figure 36. General view of road cut showing volcanic tuff ridges on both sides of Kamehameha Highway, looking towards T-005 (column foundation) location, view to south



Figure 37. General view of Rock Land (rRK) on east side of Kamehameha Highway north of Radford Drive showing very thin overlying soil development, view to northeast



Figure 38. General view of Pearl Harbor Naval Base Station at the northeast corner of Kamehameha Highway (in background) and Radford Drive (at right), view to west



Figure 39. General view of Pearl Harbor Naval Base Station on the east side of Kamehameha Highway and just south of Radford Drive (arcing to the southeast in background), view to east



Figure 40. General view of Airport Section 3 corridor between T-013 (column foundation) in foreground and T-012 (column foundation) at H-1 East on-ramp, view to north



Figure 41. General view of rail alignment between T-013 (column foundation) and T-014 (column foundation), on west (*makai*) side of Makai Frontage Road, view to south



Figure 42. General view of T-015 (column foundation) location looking towards T-014 (column foundation) location, west of H-1 East and east of Makai Frontage Road, view to northeast



Figure 43. General view from T-015 (column foundation) location towards Honolulu Fire Department training facility on Nimitz Highway, view to southeast



Figure 44. General view of T-016 (column foundation) location southwest of H-1 East Freeway at right, view to northwest



Figure 45. General view of Airport Section 3 corridor between T-017 (column foundation) location and T-018 (column foundation) location on *makai* (south) side of H-1 Freeway viaduct/Nimitz Highway (at left), view to east



Figure 46. General view of Airport Section 3 corridor towards T-020 (column foundation) location from intersection of Aolele Street and Nimitz Highway looking towards Honolulu International Airport Terminal, view to south



Figure 47. General view of Airport Section 3 corridor at Honolulu International Airport Terminal, looking towards T-021 (column foundation) location, view to southeast



Figure 48. General view of T-021 (column foundation) location as it approaches the Honolulu International Airport Station and Honolulu International Airport Station (Alternative A), view to southwest



Figure 49. General view of Honolulu International Airport Station location, view to north



Figure 50. General view of Honolulu International Airport Station Alternative A , view to south



Figure 51. General view of Airport Section 3 corridor along Aolele Street (at right) looking towards the Honolulu International Airport Station and Honolulu International Airport Station (Alternative A), view to west



Figure 52. General view of along Aolele Street (at left) looking along Airport Section 3 corridor towards T-030 (column foundation) location, view to west



Figure 53. General view of rail alignment between Ualena Street (at right) and T-030 (column foundation) location, view to west



Figure 54. General view of Airport Section 3 corridor along Ualena Street (at left) looking towards the intersection of Ualena Street and Lagoon Drive, view to east



Figure 55. General view of Lagoon Drive Station location, at the intersection of Lagoon Drive and Waiwai Loop, view to east



Figure 56. General view of Lagoon Drive Station location, at the intersection of Lagoon Drive and Waiwai Loop, view to west



Figure 57. General view of Airport Section 3 corridor between Lagoon Drive Station and T-037 (column foundation) along Waiwai Loop, view to east



Figure 58. General view of Airport Section 3 corridor between T-038 (column foundation) and T-037 (column foundation), view to west



Figure 59. General view of Airport Section 3 corridor between T-038 (column foundation) and T-039 (column foundation), view to northeast



Figure 60. General view of Airport Section 3 corridor between T-039 (column foundation) and T-040 (column foundation), view to northeast



Figure 61. General view of T-040 location along Airport Section 3 alignment, looking towards T-039, view to west

7.2 Test Excavation Results

Forty-seven test excavations were carried out in the Airport Section of the HHCTCP project. An overview of the geographic distribution of these test excavations is provided in Figure 30 and Figure 31. A detailed discussion of each test excavation follows including reference to a more detailed location map, a location photograph for the test excavation, a photograph of a profile view a drafted figure of the profile a presentation of the stratigraphy in table format and a write-up of the endeavor and finds. A summary discussion of finds and their significance follows the description of the individual test excavations.

Stratigraphic descriptions describe each sediment using USDA soil description observations/terminology (Natural Resources Conservation Service/USDA 2002). Observations include: color; texture; structure; consistency; plasticity; cementation (if applicable); origin of sediments (marine/terrestrial); descriptions of any inclusions, such as cultural material and/or roots; lower boundary distinctiveness and topography; and other general observations. These observations help assess the differences and similarities between strata within a single excavation and between strata in multiple excavations. They help identify a sediment's mode of deposition and likely origin of the sediments. These sediment observations taken in the context of other observations, including general project area setting, USDA Soil Survey data, and the results of background research, provide information on geomorphology, depositional history, and past land use of the study area. Stratigraphic descriptions are a key component in the identification and documentation of the study area's cultural deposits and/or archaeological sites/features.

All of the current study area has been developed with in-use streets, sidewalks, parking areas, buildings, and landscaped areas. Commonly, there are multiple modern and/or historic (older than 50 years) fill episodes in the study area. Fills generally are sediments whose deposition is entirely the result of human activity. They have been transported or reworked by human activity and are usually related to construction episodes, land reclamation, and grading. An important part of each stratigraphic description is the identification of the boundary between the "natural" pre-fill sediments and the overlying "fill" sediments. Sometimes this distinction is not clear (particularly as the fill has often been acquired in the immediate vicinity and is quite similar in geomorphology) and the sediment description reflects this. Where possible, the following discussions of individual test excavations provide additional descriptive information on fill layers, calling out those that are more local in origin and those that are imported from a distance. Some of the terms used to describe different fill strata include:

- **Natural:** completely or relatively undisturbed sediment that would exist without human intervention—does include otherwise natural strata that include some admixture of archaeological features and cultural material—for example an otherwise natural sand A horizon that includes evidence of past human land use, such as features, artifacts, and midden from past land use. Often the upper boundary of natural sediments indicates a relatively longer period of exposure/stability than fill sediments, and represents a buried former land surfaces.
- **Reworked Fill:** typically a fill deposit that has not been transported far and whose parent material, based on observations, is likely the sediment immediately available from the surrounding environment, usually contains an admixture of construction debris or cultural

material that was incorporated when the available natural sediment was disturbed and transported.

- Introduced Fill: unlike a reworked fill, these deposits have been transported from some other location and their parent material is not locally available—typically quite distinct from any natural sediment at that area.
- Locally Procured Fill: similar to reworked fill in that its parent material is immediately available in the vicinity but that may have been transported greater distances than a reworked fill, which is typically from the immediate area.
- Top Soil: more fertile soil brought in to support landscaping—typically loams that will support lawns and other plantings
- Base Course: layer of homogenous sediment, typically crushed coral or compacted, basalt gravel (typically commercially standardized to size), deposited as part of construction so that it can be uniformly compacted to produce a stable foundation or base for an overlying building foundation or structure (such as a roadway).

Limitations and important documentation procedures for each test excavation are summarized in the “Documentation Procedures” section of each individual test excavation summary. Where possible, excavation was carried out to 3 m depth which was the maximum possible due to safety concerns, the limits of the excavator’s reach, and the limits in excavation depth that could be safely shored with the available shoring system. Of course, reaching bedrock before this depth halted excavation at shallower depths. Sometimes there were utilities in the excavation sidewalls, or loose fill, often with boulders, that made excavation sidewalls unstable and unshoreable. In these instances, safety concerns often limited depth of excavation and trench recording procedures—for example, if shoring could not be used because of loose, unstable excavation sidewalls, then archaeologists could not enter the excavations to take samples and draw stratigraphy. In these instances, documentation proceeded in the best, most thorough manner available given the limitations—in consultation with the on-site safety consultant.

In some test excavations, concrete slabs, potential concrete utility jackets, or other paving layers were encountered. With these pavement layers, particularly the concrete layers, which could be unidentified utility jackets containing live utilities, there was always concern about continuing the excavation through these layers. Safety was always a primary consideration and the archaeologists followed the lead of the on-site safety consultant regarding when it was acceptable to continue excavation through these paving layers.

Ground Penetrating Radar (GPR) survey, as outlined in the AISP research design and methods (refer to Appendix C) was a substantial part of the AIS fieldwork effort. The following excavation summaries briefly summarize the GPR results at each excavation. Appendix E is the overall GPR Method Investigation for the Airport Section 3 AIS.

7.2.1 Test Excavation 1

Ahupua'a:	Hālawā
LCA:	#2131:1
TMK #:	9-9-003: 066
Street:	Kamehameha Highway
Owner:	Kronick, Harry B. Trust
Elevation:	5.31 m
UTM:	610237.56 mE 2363044.56 mN
Max Length/ Width/ Depth:	3.1 m/ 1.1 m/ 3.0 m
Orientation:	270/90 TN
Targeted Project Component:	Guideway column.
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 1 (T-001) was located in a “traffic island” at a 4-lane intersection that connects the Pearl Harbor Visitor Center to Kamehameha Highway and the residential Kalaloe St. (LCA 2131:2) (Figure 62 and Figure 63). The elevation is significantly higher than at the Pearl Harbor Visitors Center (approximately 3 m) to the west, and lower than the adjoining residential area to the northeast. Test Excavation 1 was in an in-use roadway that appeared to have been raised from the surface elevation of the Pearl Harbor Visitors Center.

Summary of Background Research and Land Use: The 1873 Lyons Pearl Lochs map (see Figure 11) indicates a road in this immediate vicinity led from the Hālawā Mill (400 m to the east) to a boat landing 250 m northwest of Test Excavation 1. A reconstruction of the cultural landscape at lower Hālawā Stream (Klieger 1995:61; see Figure 9) indicates the Pu'uone Kalokoloa fishpond immediately to the east although most of the fields and habitations were further up Hālawā Stream. The Loko Kunana fishpond was located on the opposite (south) side of the mouth of Hālawā Stream. The “Mill Roads” indicated in historic maps between 1873 and 1897 is consistent with the current location of Kalaloe Street. An 1899 Beasley and Taylor map (see Figure 12) shows the OR&L and an associated Hālawā Station approximately 250 m west of T-001. A 1919 Fire Control Pearl Harbor map (Figure 14) shows the same road and railroad alignments. A 1933 War Department map (Figure 16) shows the same OR&L alignment but the Mill road is not shown. A 1943 War Department map (Figure 19) shows a subdivision 250 m. northeast of T-001. A 1953 Army Map Service Puuloa map (Figure 20) shows the established reservation southwest of T-001 with related Pearl Harbor development and reinforcing of the coastline

Documentation Procedures: Excavation was carried out to 3 m depth which was the maximum possible due to both safety concerns and the limits of the excavator's reach.

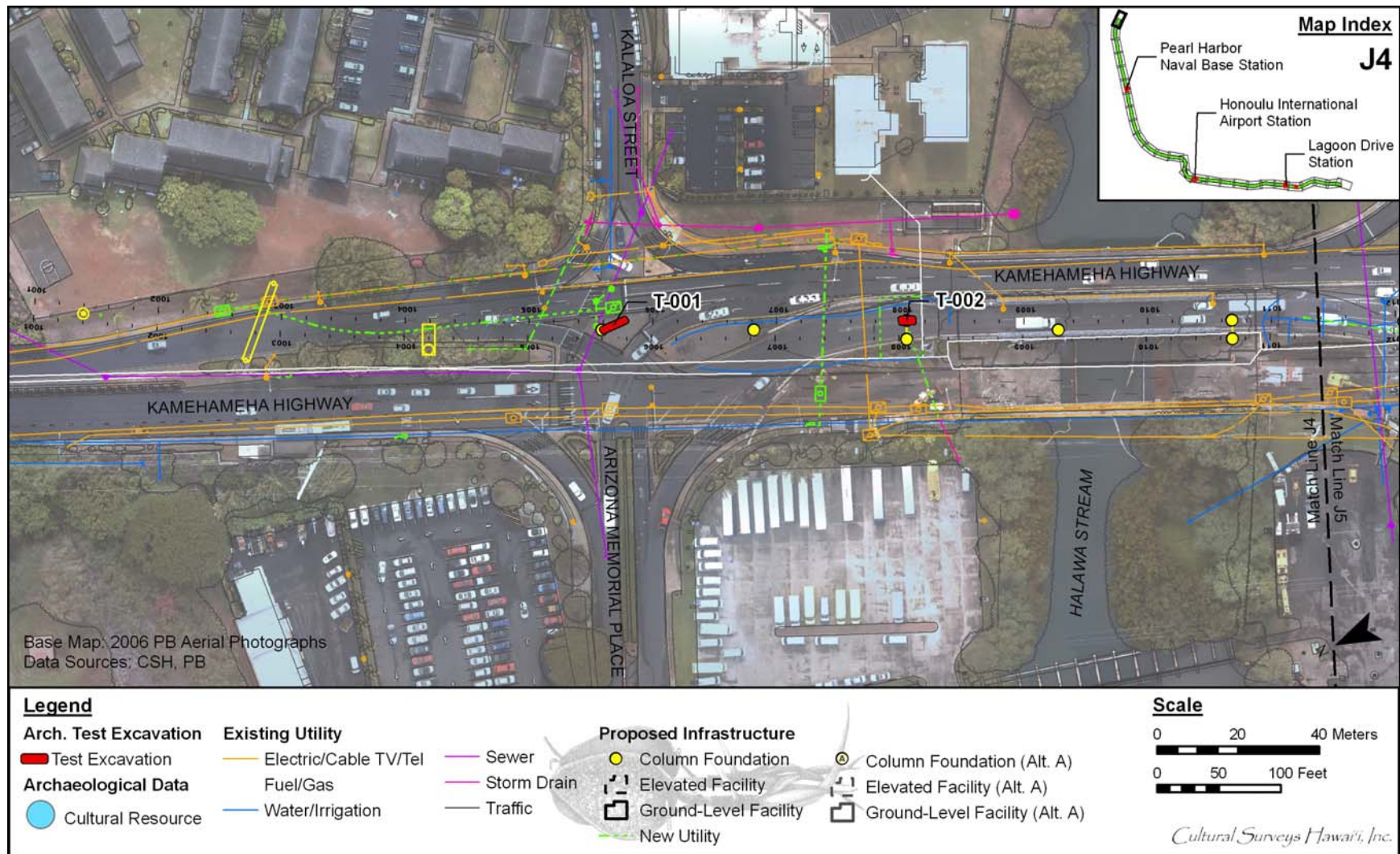


Figure 62. Map Sheet J 4, showing the location of T-001 and T-002 along Kamehameha Highway between Arizona Memorial Place and Hālawā Stream



Figure 63. Photograph of Airport Section, T-001, general location looking towards Hālawā Stream, view to south



Figure 64. Photograph of Airport Section, T-001, general view of central portion of profile, view to east

Stratigraphic Summary: The stratigraphy, presented in Figure 64 and Figure 65, consisted of asphalt (Stratum Ia), basalt gravel base course (Stratum Ib), crushed coral fill (Stratum Ic), extremely gravelly silt fill (Stratum Id), gravelly clay loam fill (Stratum Ie), very cobbly loam fill (Stratum If), and locally-procured gravelly clay loam fill (Stratum Ig). All strata were fill material to the base of excavation at 295 cmbs, with Stratum Ig suggestive of locally procured material with boulders of local tuff. The stratigraphy was consistent with the USDA Fill Land (FL) designation.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: A single *Chama iostoma* rock oyster shell was recovered from Stratum Ig (see Section 8.2 and Figure 245).

Other Lab Results: A bulk sample of Stratum Ig was collected at 230-260 cmbs. No material was identified within the bulk sample sediment matrix during laboratory analysis.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities (see Appendix E). Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-001 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 15 cmbs and again around 50 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 100 cmbs (see Appendix E for more details).

Summary: T-001 was terminated at a maximum depth of 3.0 m. Stratigraphy present within T-001 consisted entirely of fill deposits (Stratum Ia-Ig). A single *Chama iostoma* rock oyster shell was recovered from Stratum Ig. A bulk sample collected from Stratum Ig did not contain additional cultural material. No cultural resources were identified.

T-001 was excavated in close proximity to the previously placed P-38 series of pole locations (poles P38, P38A, P38b and P38c) monitored by Archaeological Consultants of Hawaii, Inc. (Avery et al. 1994:6). Near the mouth of Hālawā Stream the Avery et al (1994:24) study similarly documented multiple historic fill deposits down to sea level. The Avery et al. 1994 study and the present work support the conclusion of an International Archaeological Research Institute, Inc. archaeological resources survey for a Hālawā Bridge replacement project that: “20th century landscape modifications, including the presence of large quantities of fill material along the banks of [Hālawā] stream, several subterranean drainage pipes, and a concrete channel lining, have likely destroyed historic sites.” (Dye 1999: 4).

Historic evidence indicates substantial traditional Hawaiian activity in the vicinity of the mouth of Hālawā Stream. The thick fill deposits noted by Avery et al (1994:24) and Dye (1999: 4) again precluded documentation of any archaeological evidence of this activity.

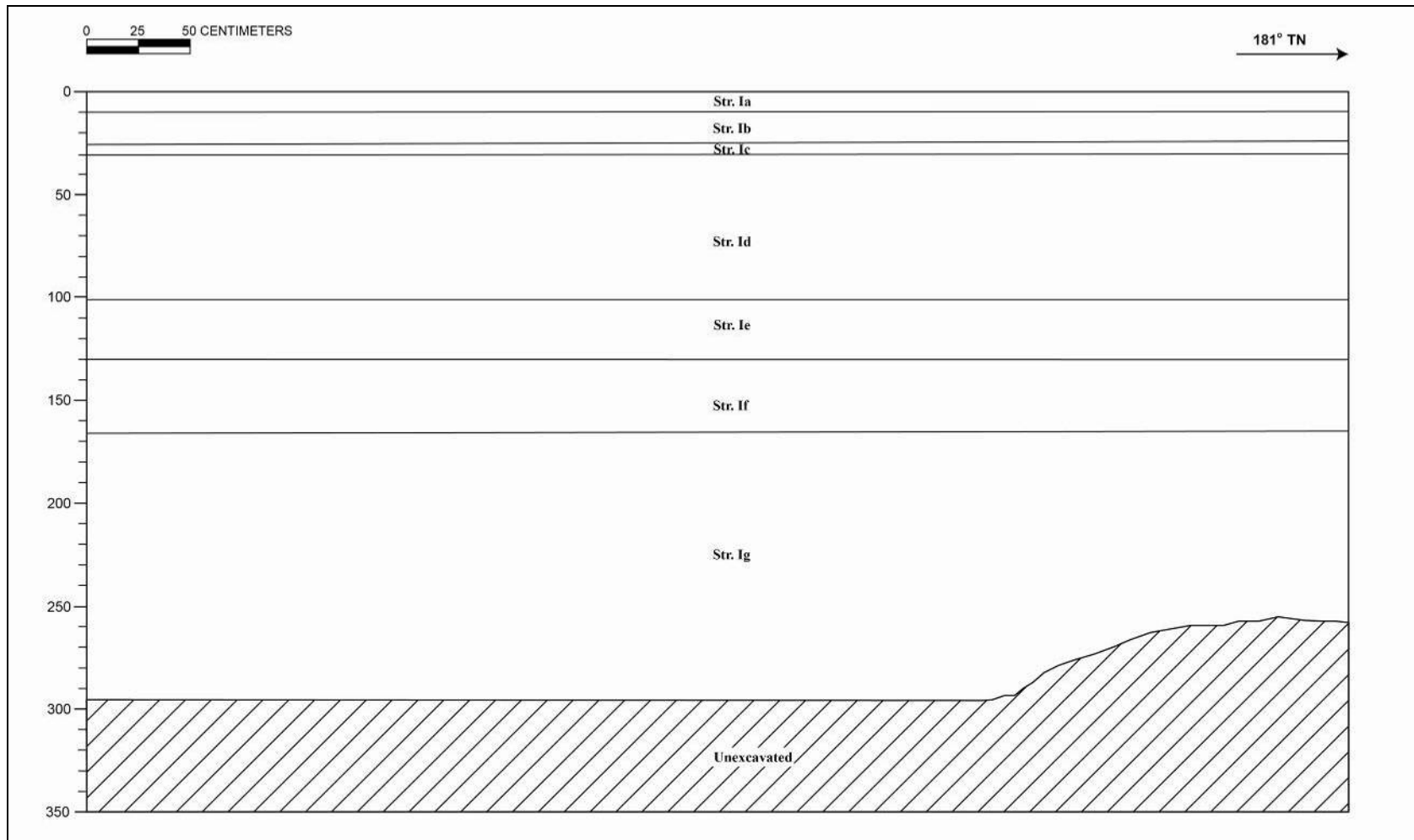


Figure 65. Airport Section, T-001 east profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt
Ib	10-25	Fill; gravel; 10 YR 5/1 (gray); single-grain structure; dry, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; base course
Ic	25-30	Fill; extremely gravelly sand; 10 YR 4/4 (dark yellow brown); weak, fine, blocky structure; moist, very friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; crushed coral base course
Id	30-100	Fill; extremely gravelly silt; 5 YR 3/4 (dark red brown); single-grain structure; moist, loose consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; contains angular basalt gravel
Ie	100-130	Fill; gravelly clay loam; 10 YR 3/4 (dark yellow brown); weak, fine, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary; contains angular basalt gravel
If	130-165	Fill; very cobbly loam; 10 YR 3/2 (very dark grayish brown); weak, fine, crumb structure; moist, very friable consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; contains angular basalt cobbles
Ig	165-295	Fill; gravelly clay loam; 7.5 YR 4/3 (brown) with 30% small red mottles; weak, fine, crumb structure; moist, very friable consistency; slightly plastic; terrigenous origin; lower boundary not visible; contains both angular and water worn gravel to cobbles, few small boulders, (1) bivalve shell (collected); contains angular basalt gravel; locally-procured sediment used as fill

7.2.2 Test Excavation 2

Ahupua'a:	Hālawā
LCA :	Ali'i Award: LCA #s 8516B & 7712 (to Grace Kama'iku'i Young Rooke and Kekūanaō'a)
TMK #:	9-9-003
Street:	Kamehameha Highway
Owner:	Kronick, Harry B. Trust
Elevation:	8.4 m
UTM:	610208.48 mE 2363044.56 mN
Max Length/ Width/ Depth	3.6 m / 1.0 m/ 2.75 m
Orientation:	200/20 TN
Targeted Project Component:	Column Guideway
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 2 (T-002) was within a divider portion (landscaped with *naupaka*) of the Kamehameha Highway causeway between Arizona Memorial Place and Hālawā Stream at the mouth of Hālawā Valley (Figure 62 and Figure 66). The excavation local was approximately 8 m above the water of Hālawā Stream located approximately 20 m to the south. It was slightly elevated from the surrounding roadway. Other than the roadway, the surrounding landscaped area is approximately level.

Summary of Background Research and Land Use: A reconstruction of the cultural landscape at lower Hālawā Stream (Klieger 1995:61; see Figure 9) indicates no specific human activity between the “Mill Roads” (approximating modern Kalaloa Street) and Hālawā Stream. The Pu'uone Kalokoloa fishpond was approximately 50 m to the east although most of the fields and habitations were further up Hālawā Stream. A 1873 Lyons map of Pearl Lochs (Figure 11) indicates the T-002 area was formerly mud flats and ~ 30 m east of the coast line. A Beasley and Taylor map (see Figure 12) shows the OR&L and an associated Hālawā Station approximately 250 m west of Test Excavation 2.

Documentation Procedures: T-002 was excavated to 2.8 m at the south end. This was the maximum possible due to both safety concerns and the limits of the excavator's reach.

Stratigraphic Summary: The stratigraphy, presented in Figure 67 and Figure 68, consisted of imported topsoil fill (Stratum Ia), coral gravel base course (Stratum Ib), extremely gravelly clay fill (Stratum Ic), and locally-procured clay fill (Stratum Id) overlying basalt bedrock. A cement cylinder and cement slab fragments were observed within Stratum Id between 210-240 cmbs.

The stratigraphy was consistent with the USDA soil survey designation of Fill Lands (FL). The test excavation was stopped in the northeast at 240 cmbs due to the presence of a large boulder. The south end was excavated to basalt bedrock at a depth of 280 cmbs.



Figure 66. Photograph of Airport Section, T-002, general location looking towards Hālawā Stream, view to south



Figure 67. Photograph of Airport Section, T-002, general view of profile, view to southeast

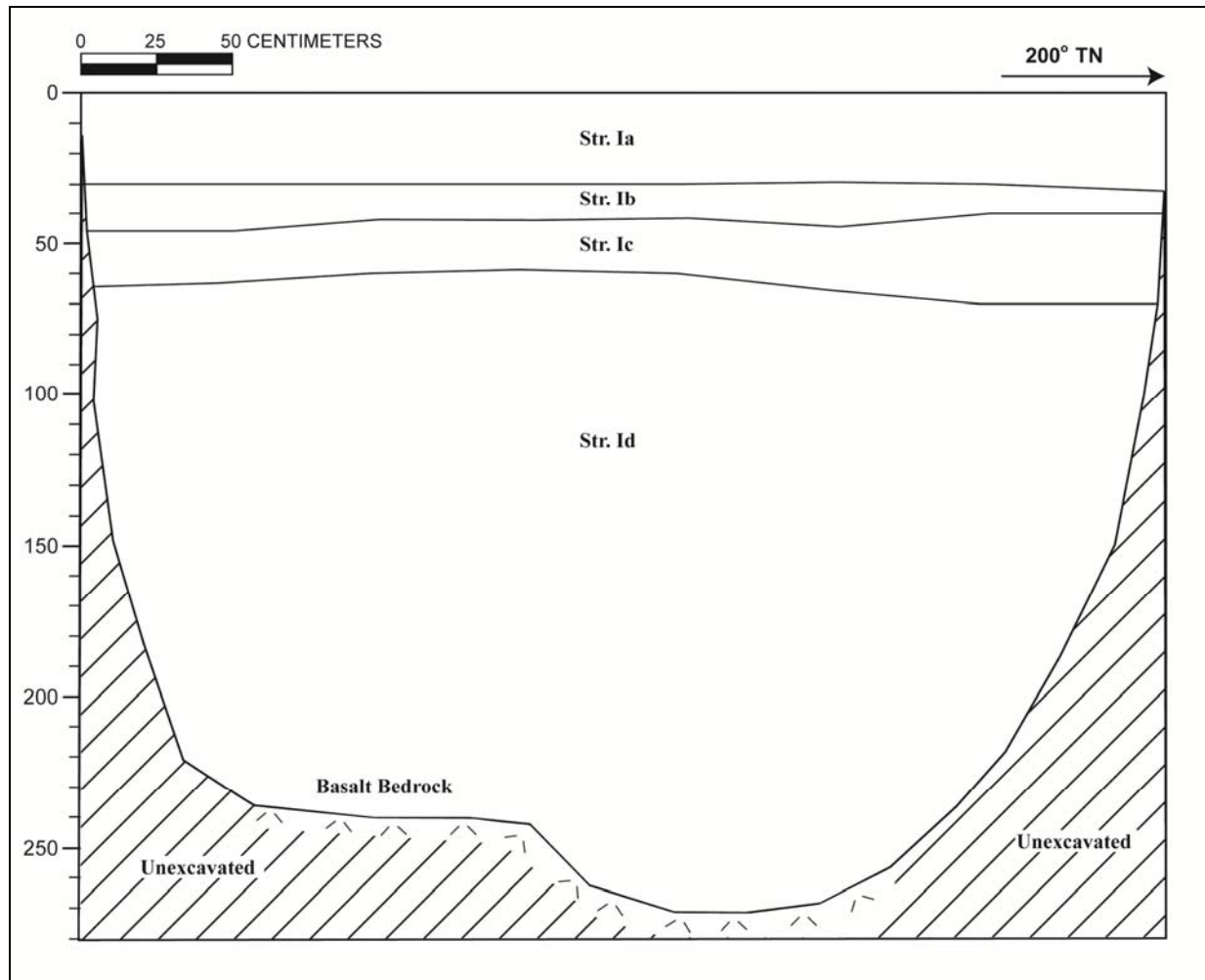


Figure 68. T-002 east profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-30	Fill; sandy silt loam; 10 YR 4/3 (brown); single-grain, fine structure; dry, loose consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; many, medium, coarse roots; topsoil; landscape fill (modern)
Ib	30-40	Fill; 10 YR 5/1 (gray); extremely gravelly silty sand; single-grain, coarse structure; dry, loose consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; few, fine, medium roots; coral gravel fill base course
Ic	40-60	Fill; extremely gravelly clay; 10 YR 4/4 (dark yellowish brown); single-grain, coarse structure; dry, weakly coherent consistency; slightly plastic; mixed origin; clear, smooth lower boundary; reworked alluvial silt loam with 60% coral and basalt cobbles and boulders
Id	60-275	Fill; clay; 10 YR 4/2 (dark grayish brown); single-grain, medium structure; moist, friable consistency; slightly-plastic; terrigenous origin; lower boundary not visible; locally procured fill with concrete debris

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples were collected in the field for laboratory analysis.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 25 cmbs.

GPR depth profiles for T-002 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicates a change in reflectivity occurring around 25 cmbs and again around 75 cmbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 115 cmbs (see Appendix E for more details).

Summary: T-002 was located in a landscaped planter/median at the north bank of Hālawā Stream between the north and south bound lanes of Kamehameha Highway. According to background research T-002 was located where there once were low-lying mud flats of Hālawā Stream. T-002 was excavated very close to the P-38 series of pole locations (poles P38, P38A, P38b and P38c) monitored by Archaeological Consultants of Hawaii, Inc. (Avery et al. 1994:6). Near the mouth of Hālawā Stream the Avery et al (1994:24) study similarly documented multiple historic fill deposits down to sea level. The Avery et al. 1994 study and the present work support the conclusion of an International Archaeological Research Institute, Inc. archaeological resources survey for a Hālawā Bridge replacement project that: “20th century landscape modifications, including the presence of large quantities of fill material along the banks of [Hālawā] stream, several subterranean drainage pipes, and a concrete channel lining, have likely destroyed historic sites.” (Dye 1999: 4).

The Airport Section of the HHCTCP has historic evidence of substantial traditional Hawaiian activity at the two ends. The northwest end by Hālawā Stream has little archaeological potential. No cultural resources were observed.

7.2.3 Test Excavation 3

Ahupua'a:	Hālawā
LCA :	Ali'i Award: LCA #s 8516B & 7712 (to Grace Kama'iku'i Young Rooke and Kekūanaō'a)
TMK #:	9-9-002
Street:	Kamehameha Highway
Owner:	State DOT/ USA
Elevation:	3.3 m
UTM:	610147.4206 mE 2362780.074 mN
Max Length/ Width/ Depth	3.04 m/ 0.9 m/ 1.95 m
Orientation:	283/103 TN
Targeted Project Component:	Guideway column
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 3 (T-003) was in the *mauka* causeway of Kamehameha Highway near where it intersects with Hālawā Drive (Figure 69 and Figure 70). The causeway slopes down approximately 2.04 m below the surface of the road.

Summary of Background Research and Land Use: According to a 1873 Lyons map of Pearl Lochs (Figure 11), Test Excavation 3 is located in what used to be mudflats along the southwest side of Hālawā Stream and the northeast (*mauka*) side of the Loko Kunana fishpond. A reconstruction of the cultural landscape at lower Hālawā Stream (Klieger 1995:61; see Figure 9) indicates another small fishpond, Pu'uone Kaulailoa was just to the east. A Beasley and Taylor map (see Figure 12) shows the OR&L approximately 150 m west of T-003. A 1933 U.S. US Army War Department map (Figure 16) indicates a road (the early Kamehameha Highway) running in the same alignment as the current road. By 1953 (AMS Puuloa map; Figure 20) there is a road grid, likely military roads/housing, on the *makai* side of the highway.

Documentation Procedures: Due to the location on the east side of a steep slope (Kamehameha Highway causeway) and overlaying fill layers consisting of loose gravel and large boulders, T-003 was highly unstable and the walls were being undercut by collapse. Due to safety concerns the archaeologists could not stand next to the test excavation on the south, west, or north sides and therefore could not take measurements for the profile. Only approximations are presented. The archaeologists could not enter the excavation due to safety concerns (i.e., excavation collapse). All inspection of the lowest (believed to be natural) strata were made by examination of backdirt and from the east side of excavation. A datum was utilized to measure the height differential between the upslope end of the excavation and the downslope end. However, the profile was drawn from the surface level rather than the datum as the field crew could not take measurements from the unstable edge and it was easier to visually approximate strata depths from the ground surface level. Work was halted due to side wall collapse and concern for the integrity of the adjacent portion of Kamehameha Highway.

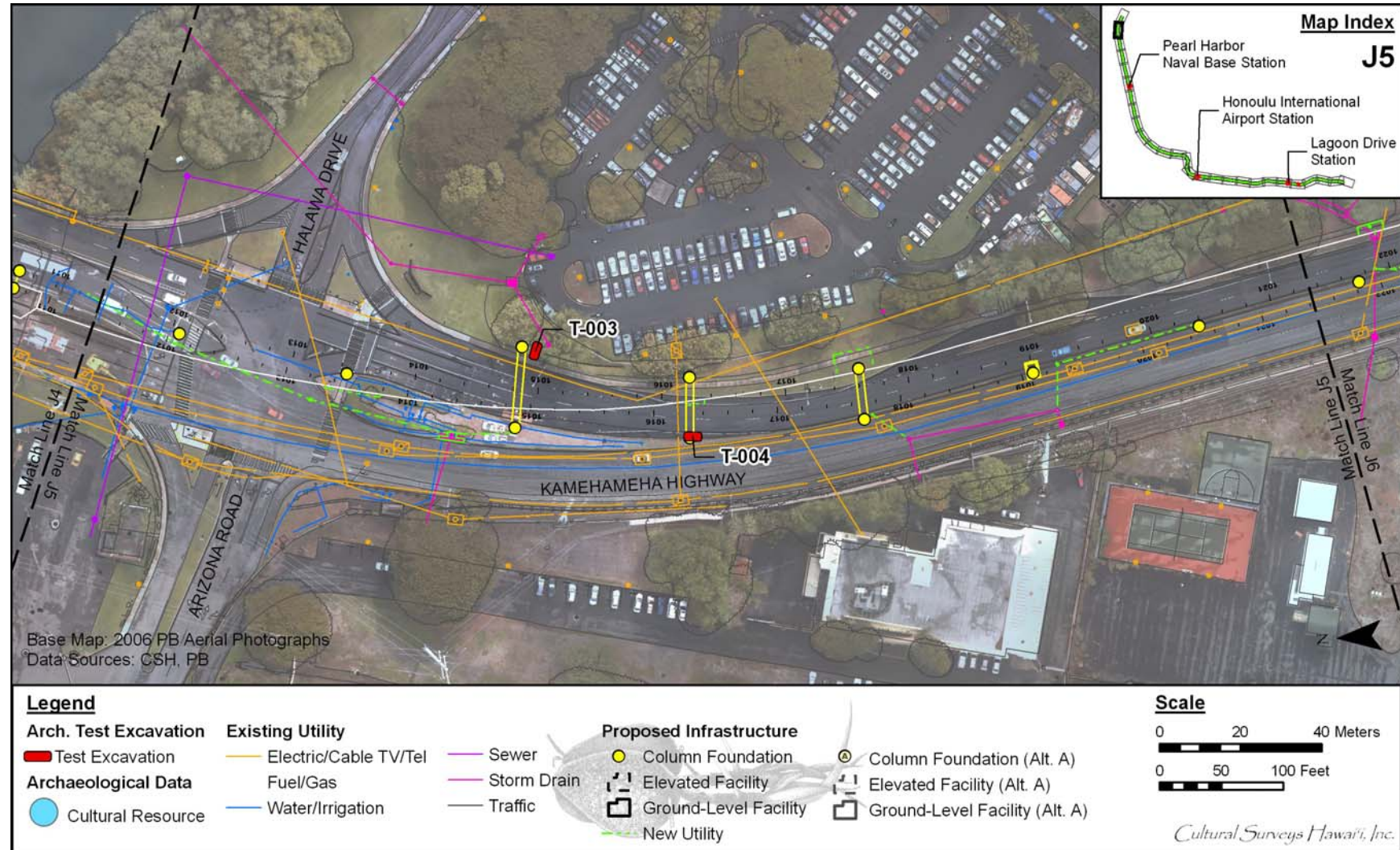


Figure 69. Map Sheet J 5, showing the location of T-003 and T-004 along Kamehameha Highway just south of Hālawā Drive/ Arizona Road



Figure 70. Photograph of Airport Section, T-003, general location, view to southwest



Figure 71. Photograph of Airport Section, T-003, general view of profile, view to west

Stratigraphic Summary: The stratigraphy, presented in Figure 71 and Figure 72, consisted of imported topsoil fill (Stratum Ia), gravelly sandy silt (Stratum Ib), extremely gravelly sand (Stratum Ic), extremely boulder sand (Stratum Id), natural clay loam alluvium with basalt boulders (Stratum II), and natural clay loam alluvium with decomposing coral and marine shell (Stratum III). The natural surface (Stratum II) was encountered at 130 cmbs.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples were recovered appropriate for laboratory analysis.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-003 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 20 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 75 cmbs (see Appendix E for more details).

Summary: T-003 was located on the east slope of an approximately 2 m-high road causeway. Given the slope, safety concerns, and excavation logistics, it was decided to excavate into the lower portion of the road shoulder (see Figure 70). Fill sediment associated with the causeway included Stratum Ic and Id, which consisted of loose gravel (Ic) and boulders (Id). This loose fill sediment created unstable conditions that limited the length and depth of the excavation.

At roughly the level of the lower surrounding lands two strata of clay loam were observed that appeared to be homogenous alluvial deposits (Strata II and III). Stratum III contained a few pieces of decomposing coral and a bivalve shell, which is consistent with natural sediment inclusions in this region of previous mudflats at the edge of Pearl Harbor and Loko Kunana. No cultural resources were observed.

Avery et al. (1994:30) document a pole excavation (Bore Hole # 50) approximately 40 m northwest at the Arizona Road/Kamehameha Highway intersection as having 4.5 m of a historic fill layer. It seems the fill continues inland but thins out significantly as the land surface rises.

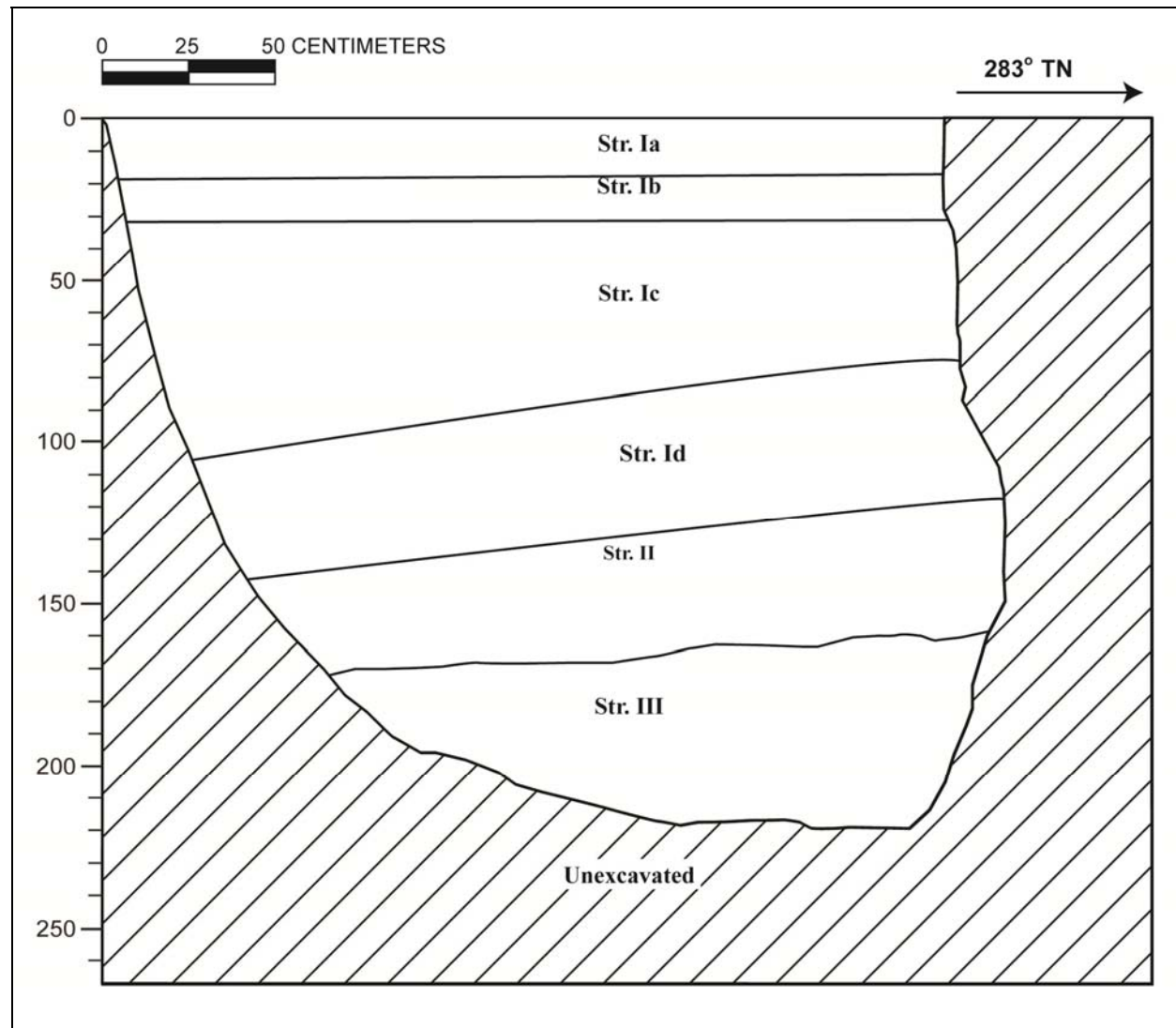


Figure 72. T-003 south profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-17	Topsoil; silt loam; 10 YR 3/6 (dark yellowish brown); weak, fine, crumb structure; moist, friable consistency; non-plastic; terrigenous origin; clear; smooth lower boundary; many, very fine to fine roots; topsoil
Ib	17-30	Fill; gravelly sandy silt; 10 YR 5/2 (brown) with mottles (50%) (pale brown); single-grain structure; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; common, very fine to fine roots
Ic	30-75	Fill; extremely gravelly sand; single-grain structure; dry, loose consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; few, very fine roots; basalt gravel fill beneath sidewalk and road causeway
Id	75-130	Fill; extremely boulder sand; single-grain structure; dry, loose consistency; terrigenous origin; abrupt lower boundary; basalt boulder fill beneath roadway and causeway
II	130-160	Natural; clay loam; 10 YR 4/3 (brown); medium structure; moist, friable consistency; plastic; terrigenous origin; clear to diffuse, smooth lower boundary; few, fine, medium roots; contains some angular basalt gravels; likely natural alluvium; appeared homogenous
III	160-195	Natural; clay loam; 10 YR 3/2 (very dark grayish brown); moderate, fine, medium, blocky structure; moist, firm consistency; plastic; terrigenous origin; lower boundary not visible; contains some decomposing coral and (1) bivalve shell (not collected due to excavation instability)

7.2.4 Test Excavation 4

Ahupua'a:	Hālawā
LCA :	Ali'i Award: LCA #s 8516B & 7712 (to Grace Kama'iku'i Young Rooke and Kekūanaō'a)
TMK #:	9-9-002
Street:	Kamehameha Highway
Owner:	State DOT
Elevation:	4.2 m
UTM:	610123.9371 mE 2362742.709 mN
Max Length/ Width/ Depth	3.0 m/ 1.0 m/ 185 cmbs
Orientation:	81/261 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 4 (T-004) was in the narrow end of the south-side median causeway of Kamehameha Highway, near where it intersects with Hālawā Drive and Arizona Road (see Figure 69 and Figure 73). The median and roads are approximately 1.8 m -2.1 m higher than the ground surface on either side.

Summary of Background Research and Land Use: According to a 1873 map of Pearl Lochs by Lyons (Figure 11), T-004 is within what were extensive mudflats along the *mauka* side of Loko Kunana (approximately 100 meters *makai*) and south of the mouth of Hālawā Stream. A Beasley and Taylor map (see Figure 12) shows the OR&L approximately 150 m west of Test Excavation 4. A 1933 U.S. Army War Department map (Figure 16) indicates a road (the early Kamehameha Highway) running in the same alignment as the current road. By 1953 (AMS Puuloa map; Figure 20) there is a road grid, likely military roads/housing, on the *makai* side of the highway.

Documentation Procedures: T-004 was located at the center of divided Kamehameha Highway. Excavation sidewalls were stable.

Stratigraphic Summary: The stratigraphy, presented in Figure 74 and Figure 75, consisted of asphalt (Stratum Ia) basalt gravel base course (Stratum Ib), and very gravelly loam fill (Stratum Ic) overlying natural basalt bedrock (Stratum II). The USDA soil survey Fill land (FL) designation for this location was determined to be accurate.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 75 cmbs.

GPR depth profiles for T-004 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 40 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 75 cmbs (see Appendix E for more details).

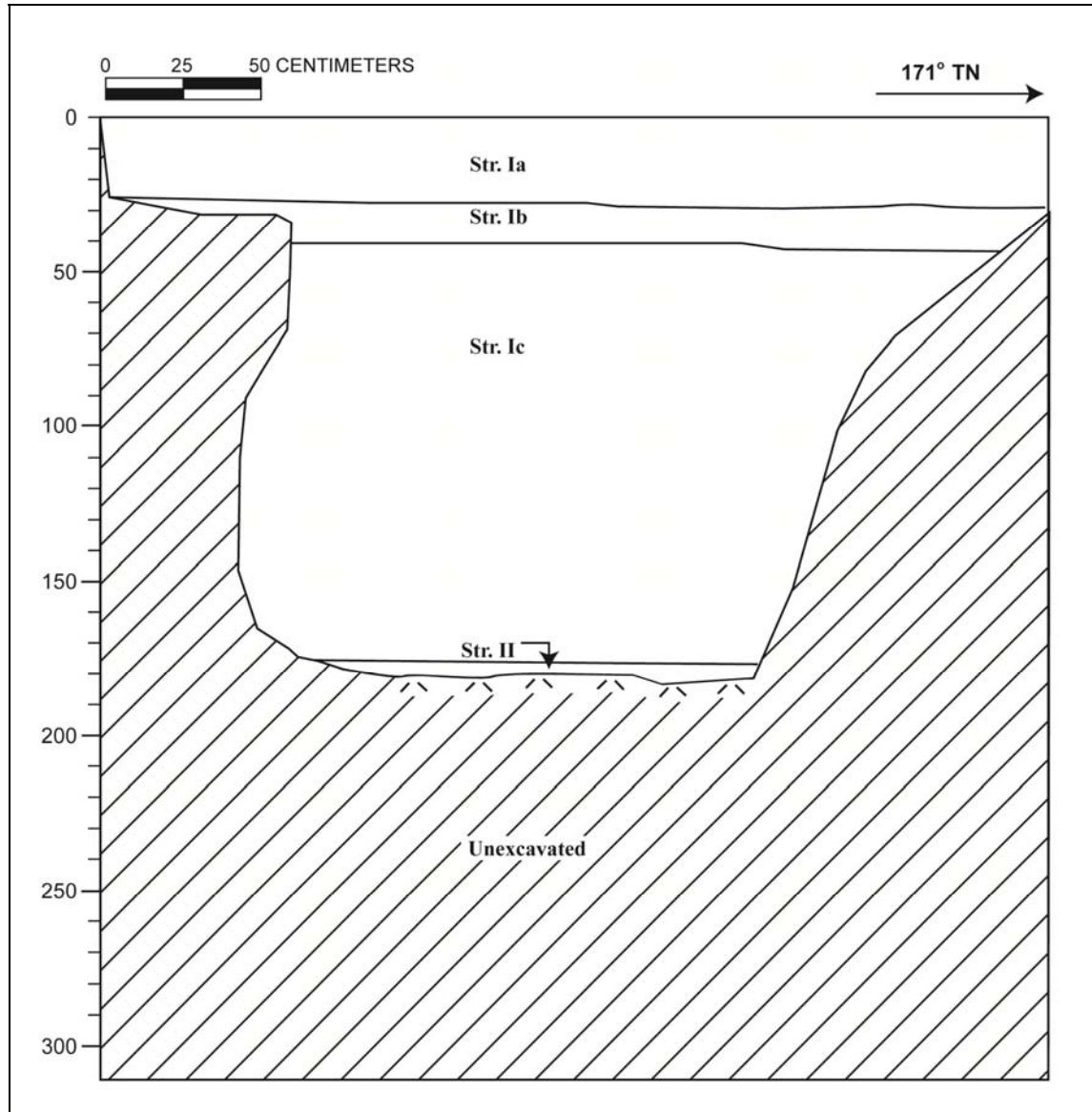
Summary: T-004 was comprised of fill layers (Stratum Ia-Ic) deposited over basalt bedrock (Stratum II). The USDA soil survey Fill land (FL) designation for this location was determined to be accurate. No cultural resources were identified.



Figure 73. Photograph of Airport Section, T-004, general location, view to north



Figure 74. Photograph of Airport Section, T-004, general view of profile, view to northwest



Stratum	Depth (cmbs)	Description
Ia	0-25	Asphalt
Ib	25-40	Fill; extremely gravelly sand; 10 YR 5/1 (gray); structureless, single-grain; moist, loose consistency; very abrupt lower boundary; basalt gravel base course
Ic	40-180	Fill; very gravelly loam; 10 YR 3/3 (dark brown); weak, crumb structure; moist, friable consistency; slightly plastic
II	180-185	Natural; basalt bedrock; 10 YR 5/1 (gray); lower boundary not visible

Figure 75. T-004 east profile and stratigraphic description

7.2.5 Test Excavation 5

Ahupua'a:	Hālawā
LCA :	Ali'i Award: LCA #s 8516B & 7712 (to Grace Kama'iku'i Young Rooke and Kekūanaō'a)
TMK #:	9-9-002:004
Street:	Kamehameha Highway
Owner:	State DOT
Elevation:	14.8 m
UTM:	610292.679 mE 2361908.039 mN
Max Length/ Width/ Depth:	3.4 m/ 0.97 m/ 1.25 m
Orientation:	178/358 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	KTKE (Kokokahi very strong clay)

Setting: Test Excavation 5 (T-005) was a road cut in Kamehameha Highway near Makin Place, on a gentle south-to-north upward slope of Makalapa Crater (this rock slope was not tested; see Figure 76 and Figure 77), between two ridges of tuff associated with the crater (see Figure 78 and Figure 79).

Summary of Background Research and Land Use: The 1933 Army War Department Waipahu quad map (Figure 16) shows the location of T-005 as adjacent to a government road that eventually became the alignment for current Kamehameha Highway. All other historic maps show no structures or natural features in the vicinity of T-005, rather it is just shown on the bare lower slopes of Makalapa Crater.

Documentation Procedures: Archaeologists took preliminary photographs of the volcanic layers of tuff and hard basalt which are visible at the top of the hill in the road cut just N of T-005 in order to document the nearby geology and to have a comparative example of what might be encountered in T-005. The excavation was through asphalt and gravel fill layers until an indurated layer was encountered. The excavator scraped with the bucket teeth to see if the hard surface consisted of large boulders or bedrock. It appeared that the BOE was bedrock, but to ascertain the circumstance, T-005 was examined at the 87 cm deep base of the excavation. The excavator dislodged pieces for examination. The substrate appeared to be bedrock, but the archaeologists instructed the excavator to continue down further to make certain reaching a maximum depth of 125 cmbs. The excavation was again entered and the walls and floor cleaned with a trowel and with a brush to expose the volcanic stone. Close-up photographs were taken, as well as, general profile photographs.

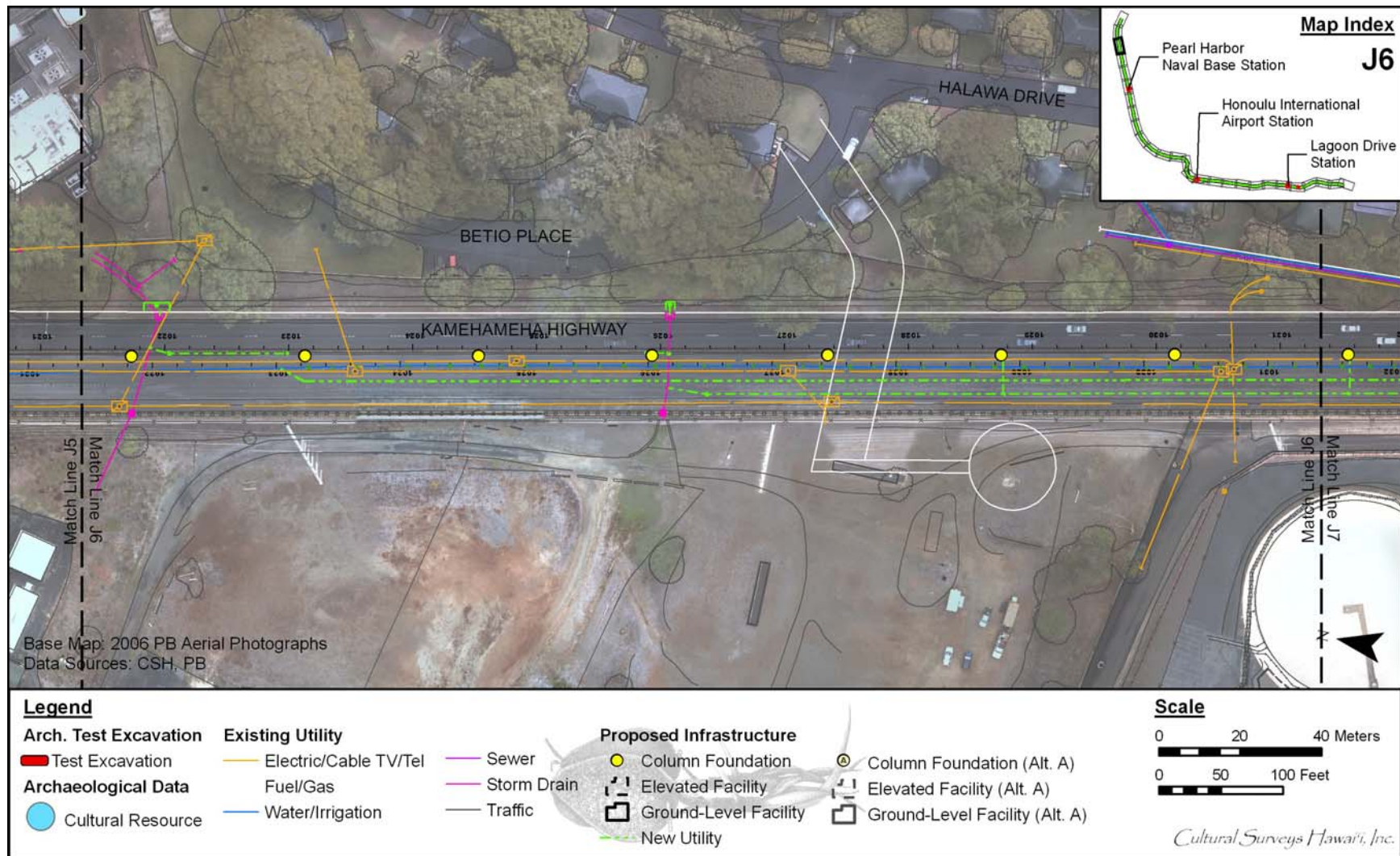


Figure 76. Map Sheet J 6, showing a stretch of the project corridor along Kamehameha Highway just south of Hālawā Drive/ Arizona Road where no testing was conducted as per AISP (Hammatt and Shideler 2011:139)

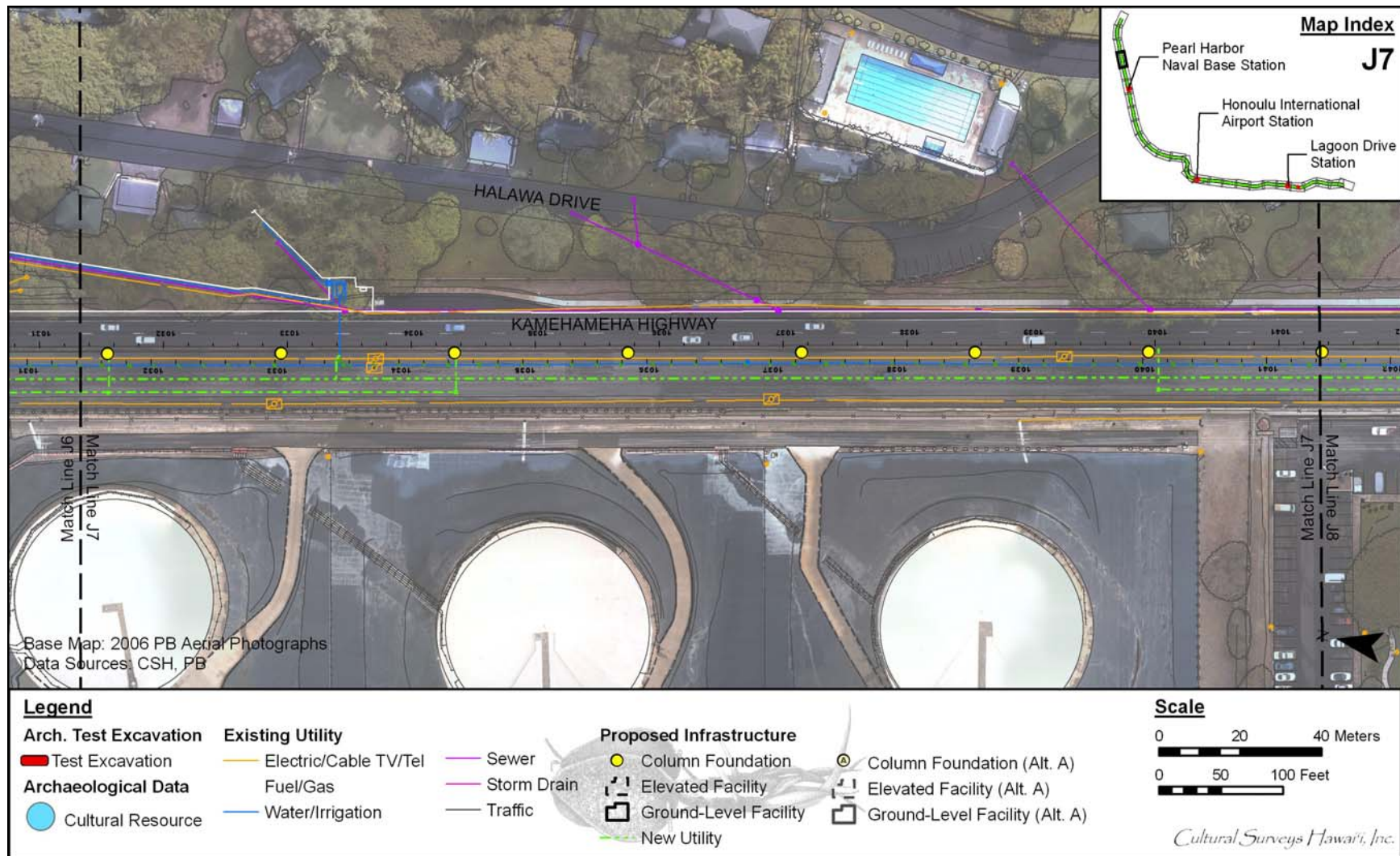


Figure 77. Map Sheet J 7, showing a stretch of the project corridor along Kamehameha Highway just south of Hālawā Drive/ Arizona Road where no testing was conducted as per AISP (Hammatt and Shideler 2011:140)

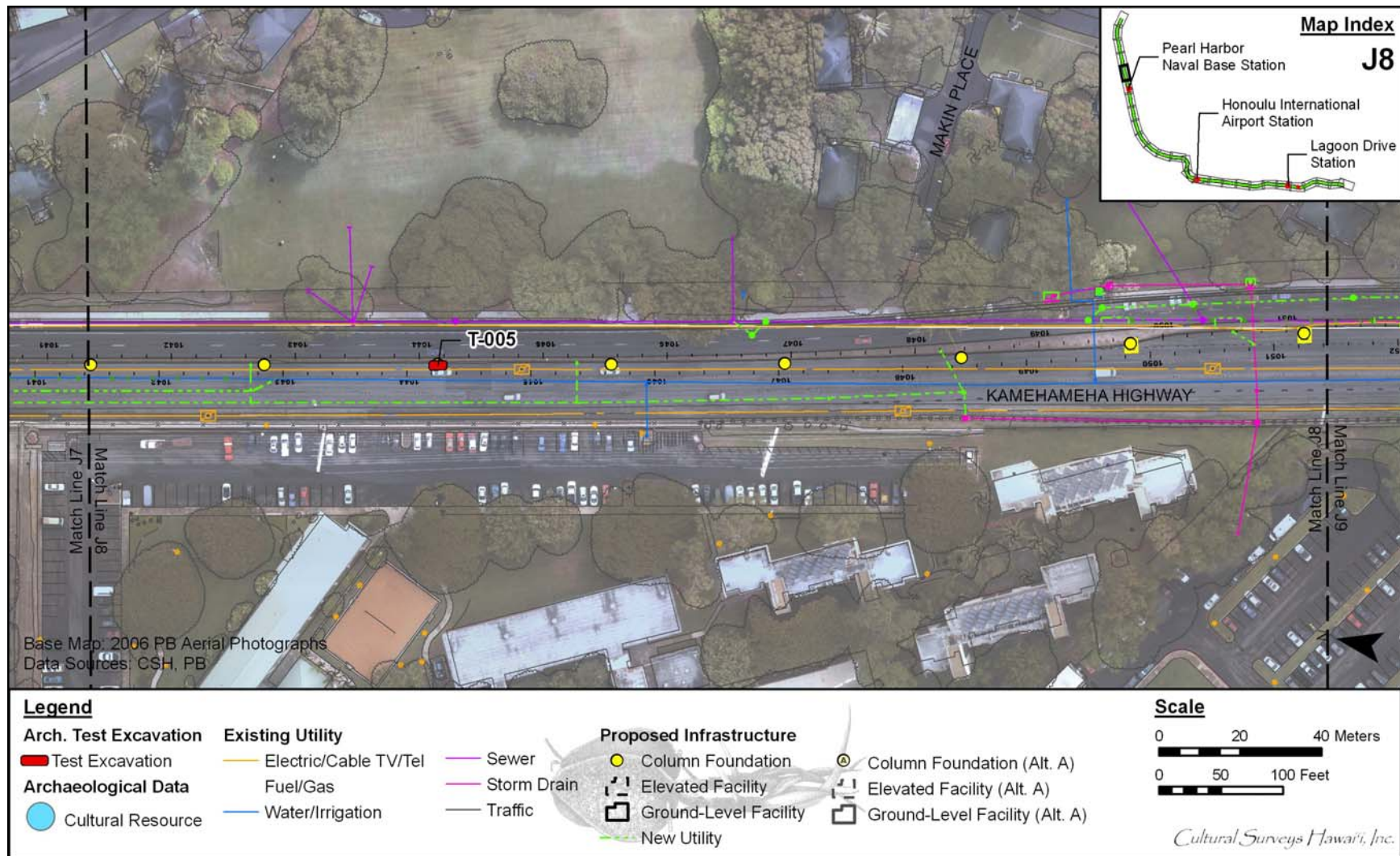


Figure 78. Map Sheet J 8, showing the location of T-005 along Kamehameha Highway

Stratigraphic Summary: The stratigraphy, presented in Figure 80 and Figure 81, consisted of asphalt (Stratum Ia), basalt gravel base course (Stratum Ib), gravelly clay loam fill (Stratum Ic), and very gravelly sand fill (Stratum Id) overlying natural extremely gravelly loam (Stratum II) and volcanic tuff bedrock (Stratum III).

Excavation results were consistent with the USDA soil designation of Kokokahi very strong clay (KTKE). The color (dark grayish brown), texture (extremely gravelly sandy clay loam), and structure (blocky) of Stratum II all correspond with the description for Kokokahi clays. This sediment also intruded into the interstices of the underlying tuff bedrock.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No organic sediments or cultural materials were observed. No soil samples were collected in the field for laboratory analysis.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 75 cmbs.

GPR depth profiles for T-005 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 50 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 90 cmbs (for more details see Appendix E).

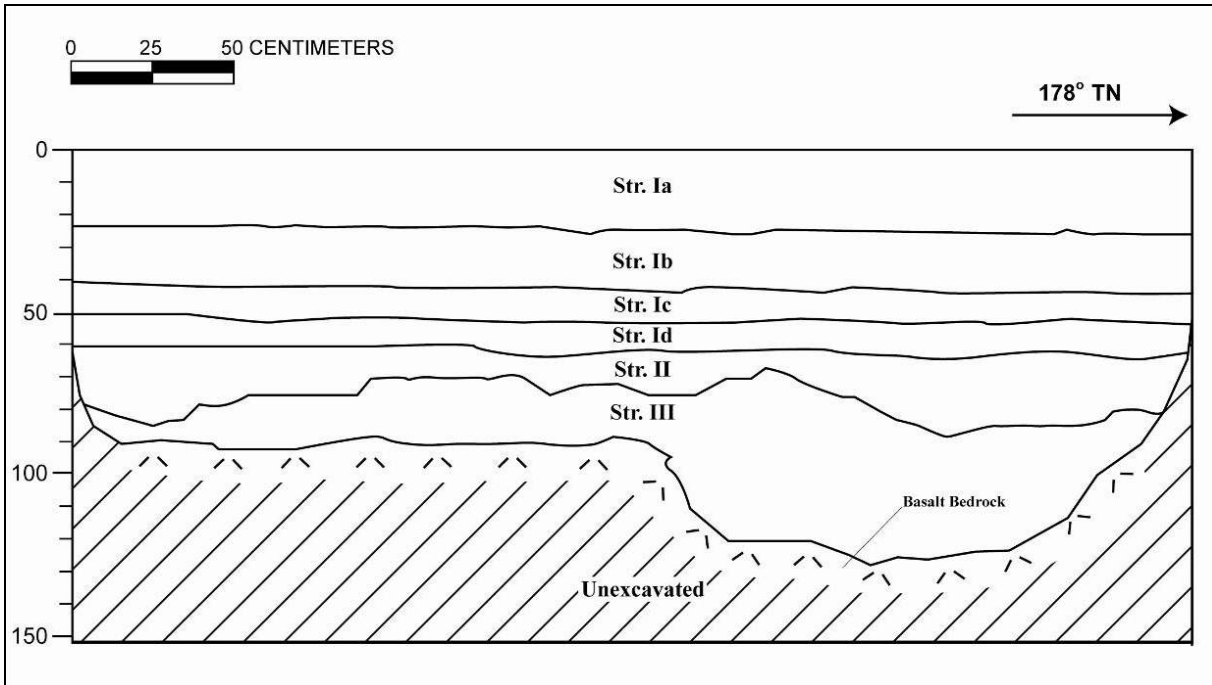
Summary: Test Excavation 5 is located on the slopes of Makalapa Crater on the downward edge of a volcanic ridge. Kamehameha Highway cuts through the top of this volcanic ridge (with a distinct roadcut through the volcanic layers) and then descends to a dip. T-005 is located on this downward slope, nearing the dip. The natural strata exposed in the excavation profile included a truncated clay-based sediment (Stratum II) which corresponded with USDA soil designation of Kokokahi very strong clay (KTKE) for the area. T-005 is in a road construction zone in which the natural surface (Stratum II) was cut and graded as it descended to the natural dip between ridges. No cultural resources were observed.



Figure 79. Photograph of Airport Section, T-005, general location, view to north



Figure 80. Photograph of Airport Section, T-005, general view of profile, view to northeast



Stratum	Depth (cmbs)	Description
Ia	0-22	Asphalt
Ib	20-40	Fill; extremely gravelly sand; 10 YR 6/1 (gray); single-grain, fine structure; moist, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; basalt gravel base course
Ic	40-50	Fill; gravelly clay loam; 7.5 3/3 (dark brown); weak, fine, crumb structure; moist, friable consistency; slightly plastic; mixed origin; abrupt, smooth lower boundary; imported fill material associated with grading and leveling for road
Id	50-60	Fill; very gravelly coarse sand; 10 YR 8/2 (very pale brown) with mottles (50%, very coarse) of 10 YR 6/1 (gray); single-grain structure; moist, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; basalt and coral gravels in coarse sand matrix
II	60-85	Natural; extremely gravelly loam; 10 YR 3/2 (very dark gray brown); weak, medium, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, wavy lower boundary; natural colluvial sediment truncated during cutting and bulldozing for modern road surface
III	65-125	Natural; basalt bedrock; 10 YR 3/1 (very dark gray); massive structure; indurated; non-plastic; terrigenous origin; lower boundary not visible

Figure 81. T-005 east profile and stratigraphic description

7.2.6 Test Excavation 6

Ahupua'a:	Hālawā
LCA :	Ali'i Award: LCA #s 8516B & 7712 (to Grace Kama'iku'i Young Rooke and Kekūanaō'a)
TMK #:	9-9-002
Street:	Kamehameha Highway at Radford Drive
Owner:	State DOT
Elevation:	8.45 m
UTM:	610372.8607 mE 2361590.969 mN
Max Length/ Width/ Depth	6.7 m/ 0.76 m/ 2.12 m
Orientation:	170/350 TN
Targeted Project Component:	Utility corridor excavation
USDA Soil Designation:	Hanalei silty clay (HnB)

Setting: Test Excavation 6 (T-006) was located in a road cut on the northern side of Kamehameha Highway where it intersects with Makalapa Road and Radford Drive (see Figure 82 and Figure 83).

Summary of Background Research and Land Use: Lyons 1873 map of Pearl Lochs (Figure 11) indicated the presence of Wailolowai Stream in the swale in this area. Lyons map also indicates a trail crossing this immediate area which possibly was related to the source of fresh water. A 1933 U.S. US Army War Department quad map (Figure 16) shows an irrigation ditch descending from a reservoir located 500 m to the east bifurcating in the immediate vicinity with both ditches descending in a generally southwesterly direction. This area appears to have been a part of Honolulu Plantation sugar cane "Field 1" by 1935 (see Figure 17). A 1943 War Department Aiea quad map (Figure 19) shows substantial housing development adjacent to the southwest and east.

Documentation Procedures: At about a depth of 2.13 m the west sidewall began to destabilize as large boulders began to fall out of the excavation wall and a decision was made to stop excavation at that point and finish documenting the east wall. Stratum II appeared to be natural sediment based on the homogeneity of the stratum and the lack of evidence for it being a fill layer (i.e., mixing of varying sediments, clear – abrupt boundaries, etc.). It is a dominantly clay material as has been previously documented in the area.

The test excavation extended to a depth of 213 cmbs. Excavation was stopped because of a concern for imminent sidewall collapse. At this point the *makai* (west) wall in Stratum II started to collapse about 2.5 m from the north end of the excavation. A bulk sample was taken from the excavator bucket due to the depth of the excavation. The lower boundary of Stratum II natural sediment was not observed.

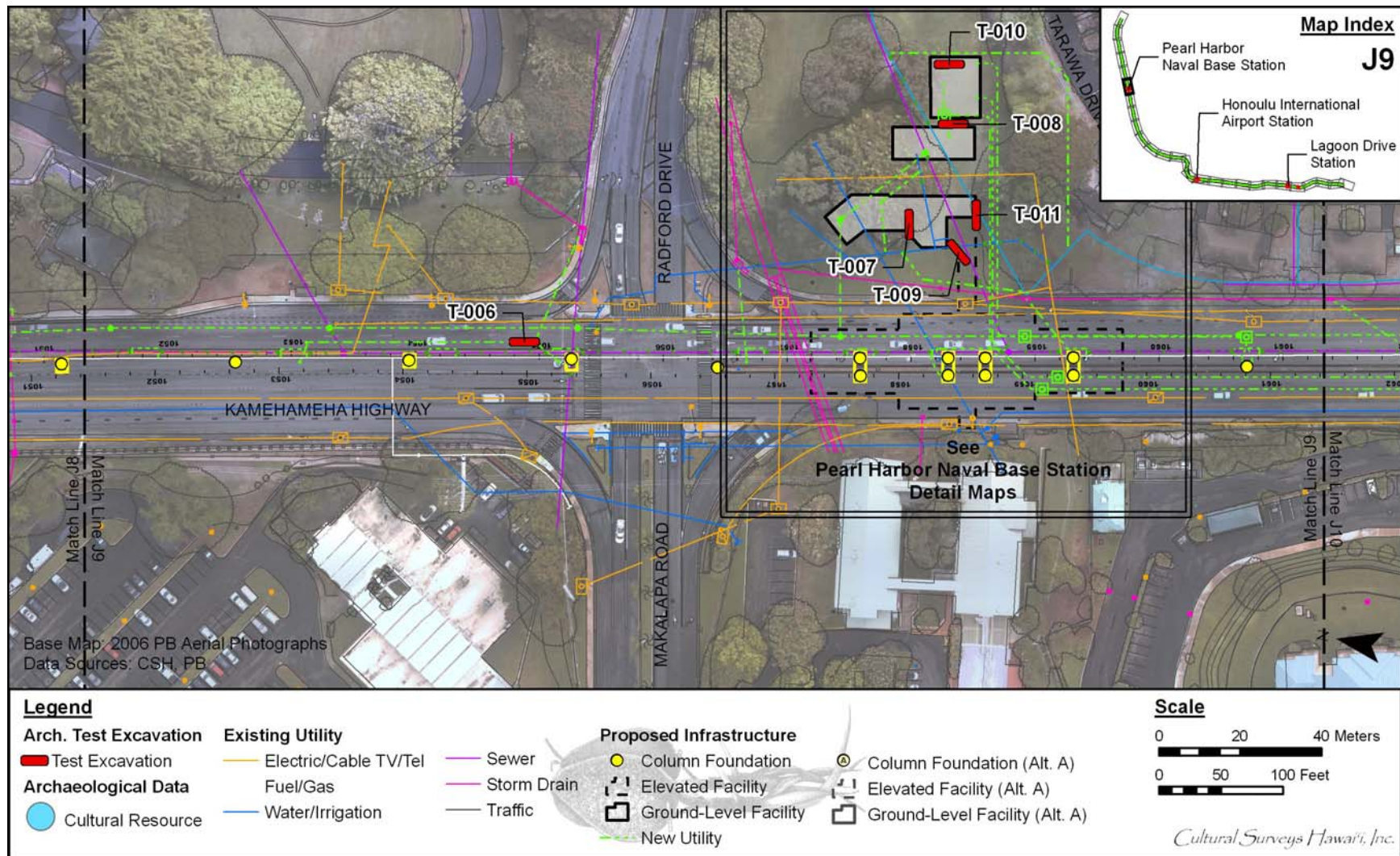


Figure 82. Map Sheet J 9, showing the location of T-006 to T-0011 along Kamehameha Highway in the vicinity of Makalapa Road/Radford Drive intersection and the adjacent Pearl Harbor Naval Base Station



Figure 83. Photograph of Airport Section, T-006, general location, view to south (Radford Drive at left)



Figure 84. Photograph of Airport Section, T-006, general view of profile, view to southeast

Stratigraphic Summary: The stratigraphy, presented in Figure 84 and Figure 85, consisted of asphalt (Stratum Ia), very gravelly to cobbly crushed coral fill (Stratum Ib), and natural very cobbly clay loam (Stratum II). Survey results did not conform to the USDA soil designation of Hanalei silty clay (HnB). The presence of a large quantity of water-rounded basalt cobbles within the upper and lower boundaries of Stratum II may be indicative of high energy alluvial deposition.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

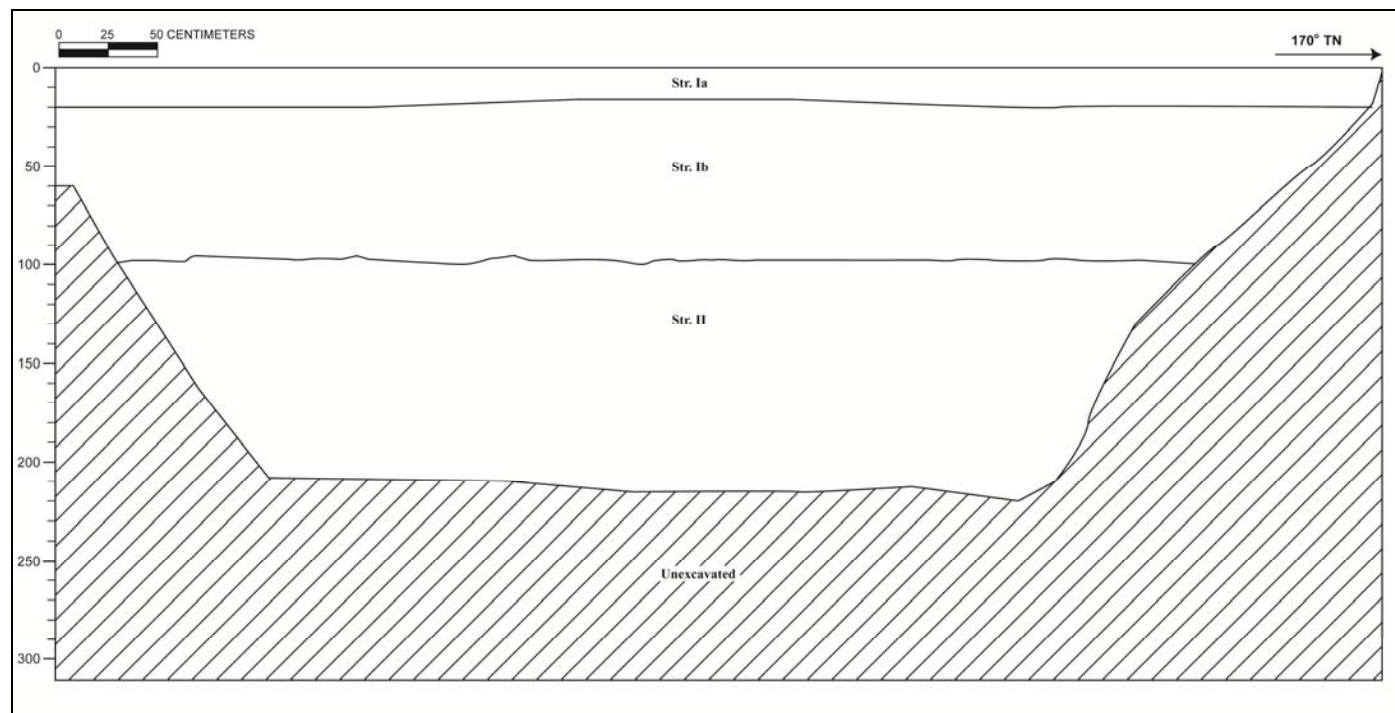
Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: A bulk sample of approximately 2.5 L of natural sediment (Stratum II) was collected from the excavator bucket during excavation due to the inability to enter the excavation at a depth of 2.13 m. A portion of the 2.5 L sample was submitted for pollen analysis. The results of this analysis are presented in Results of Laboratory Analysis, Section 8.3. The remainder of the bulk sample was wet-screened. The wet-screened sample included unidentified marine shell (less than 0.1 g), *Echinometra mathaei* (less than 0.1 g), and water-rounded gravel (155.6 g). These are understood as most likely the result of deposition from natural processes.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-006 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 75 cmbs (see Appendix E for more details).

Summary: A thick layer of asphalt (Stratum Ia) was excavated through and a thick layer of crushed coral fill (Stratum Ib) was observed. Below the crushed coral fill was a thick layer of very cobbly clay loam (Stratum II) natural sediment. The presence of a large quantity of water-rounded basalt cobbles within the upper and lower boundaries of the natural sediment indicated evidence of high energy alluvial deposition. A bulk sample of the natural sediment was collected, and a portion of the sample was submitted for pollen analysis. The results of this analysis are presented in Results of Laboratory Analysis, Section 8.3. Instability of the sidewalls effectively ended further excavation of T-006 at 212 cmbs. No cultural resources were observed.



Stratum	Depth (cmbs)	Description
Ia	0-19	Asphalt
Ib	19-100	Fill; very gravelly to cobbly sand; 2.5 Y 8/2 (pale brown); structureless; dry, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; crushed coral base course
II	95-212	Natural; very cobbly clay loam; 7.5 YR 2.5/3 (very dark brown); single-grain, weak, medium, blocky structure; dry, hard consistency; plastic; terrigenous origin; lower boundary not visible; contains one unidentified marine shell and sea urchin at 162-175 cmbs

Figure 85. T-006 east profile and stratigraphic description

7.2.7 Test Excavation 7

Ahupua'a:	Hālawā
LCA :	Ali'i Award: LCA #s 8516B & 7712 (to Grace Kama'iku'i Young Rooke and Kekūanaō'a)
TMK #:	9-9-002:004
Street:	Kamehameha Highway (<i>mauka</i> or east of highway)
Owner:	USA
Elevation:	8.7 m
UTM:	610420.5539 mE 2361504.31 mN
Max Length/ Width/ Depth	6.1 m/ 0.8 m/ 2.40 m
Orientation:	54/234 TN
Targeted Project Component:	Pearl Harbor Naval Base Station (station entrance building)
USDA Soil Designation:	Hanalei silty clay (HnB)

Setting: Test Excavation 7 (T-007) was located in a field at the base of an outcrop ledge near a subdivision on the southeast corner of the intersection of Kamehameha Highway and Radford Drive (see Figure 82, Figure 86, Figure 87 and Figure 88). The surrounding surface slopes gently downward to the north. The rock ledge is approximately 85 meters south of this excavation.

Summary of Background Research and Land Use: The immediate vicinity of test excavations 7, 8, 9, 10 and 11 is a soil swale between two easterly extending ridges of the Āliamanu and Makalapa craters Rock land outcrops (see Figure 5). The 1873 Lyons map of Pearl Lochs (Figure 11) shows what appears to be a small unnamed rivulet in this swale flowing into the small Wailolowai Fishpond at the Southeast Loch of Pearl Harbor. A north/south trending trail is also shown in this immediate area. A 1933 U.S. US Army War Department quad map (Figure 16) shows an irrigation ditch descending from a reservoir located 500 m to the east bifurcating in the immediate vicinity with both ditches descending in a generally southwesterly direction. This area appears to have been a part of Honolulu Plantation sugar cane "Field 1" by 1935 (see Figure 17). A 1943 War Department Aiea quad map (Figure 19) shows substantial housing development adjacent to the southwest and east.

Documentation Procedures: T-007 was originally in a northwest – southeast direction. This was rotated 90 degrees to northeast – southwest in order to minimize the impact to the root system of a large *Acacia* tree east of the excavation. A safety barricade was also erected around the tree to prevent scaring to the above ground roots. An arborist monitored excavation to minimize impact to roots. Following excavation, the archaeologists could not enter the T-007 due to the under cutting of the side walls and the presence of unconsolidated sediments, which would have made the excavation unsafe even with shoring.

Stratigraphic Summary: The stratigraphy, presented in Figure 89 and Figure 90, consisted of landscaping fill with a shallow excavation for a PVC sprinkler line (Stratum Ia), and gravelly clay loam fill (Stratum Ib) overlying bedrock. The hard, flat volcanic bedrock surface was

encountered at 240 cmbs. The natural underlying bedrock surface may have been graded prior to fill deposition.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps does not clearly indicate any linear features although a utility was encountered during excavation. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-007 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. A utility was observed during excavation but was not clearly defined in the GPR profile. The maximum depth of clean signal return was approximately 110 cmbs (for more details see Appendix E).

Summary: Stratigraphy present within T-007 consisted of fill (Stratum Ia and Ib) overlying natural basalt bedrock at the base of excavation. The placement of T-007 was readjusted in order to avoid the subsurface root system of a large *Acacia* tree located to the east of the excavation. No cultural resources were identified.

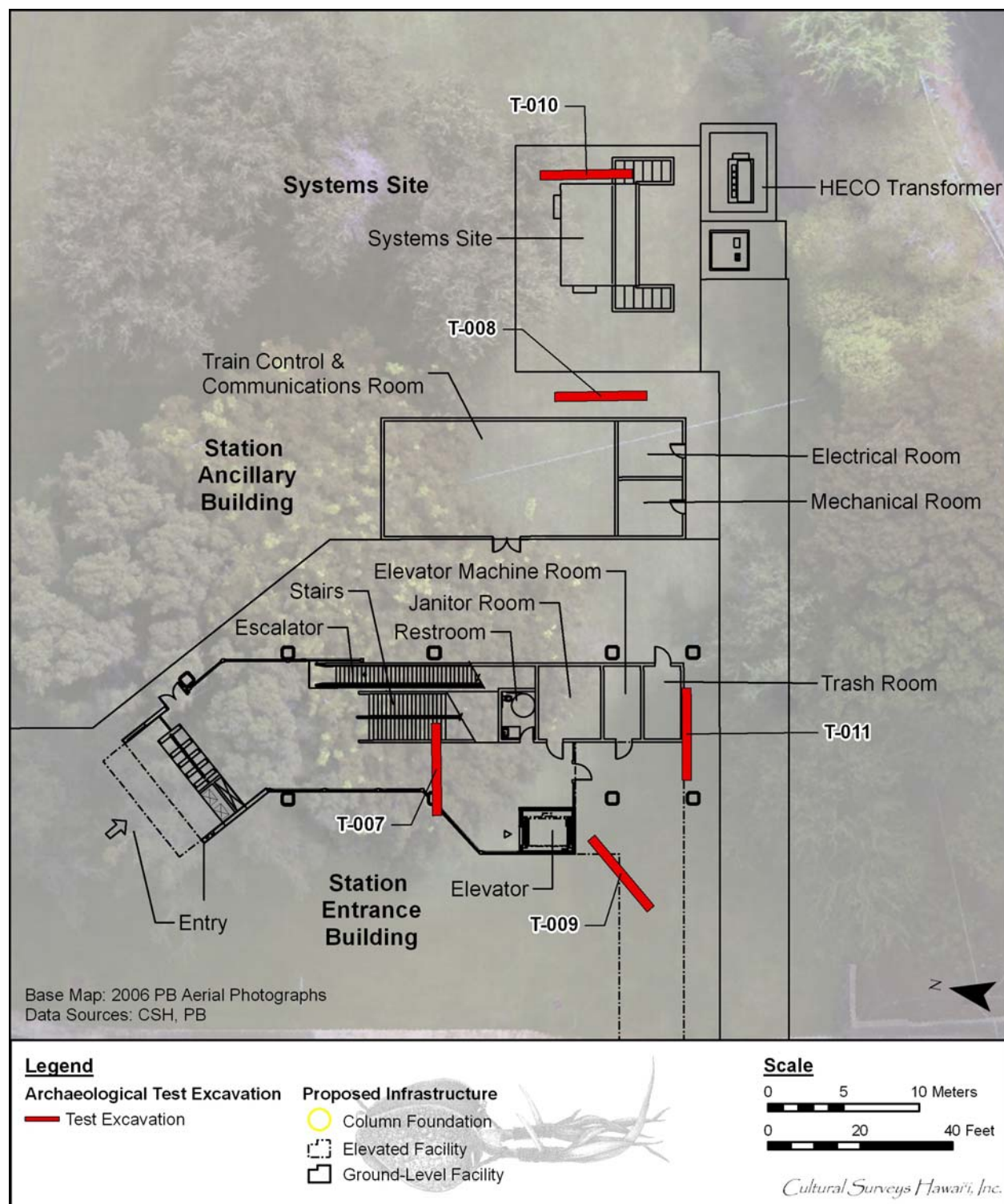


Figure 86. Pearl Harbor Naval Base Station, overall view, showing the locations of T-007 to T-011

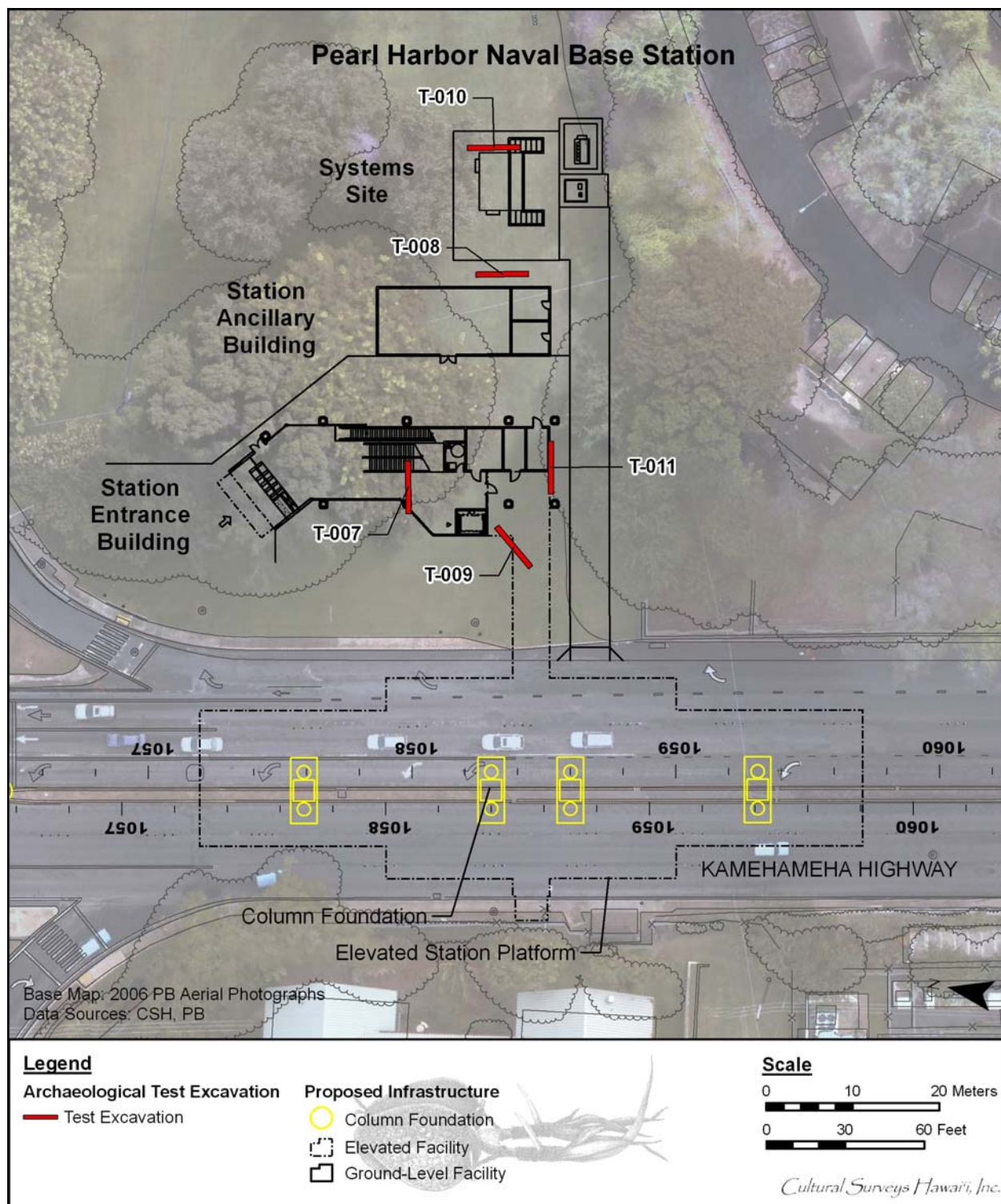


Figure 87. Pearl Harbor Naval Base Station, showing the locations of T-007 to T-011 in relation to the Station Entrance Building



Figure 88. Photograph of Airport Section, T-007, general location, Kamehameha Highway in the background, view to west



Figure 89. T-007 west profile, view to west

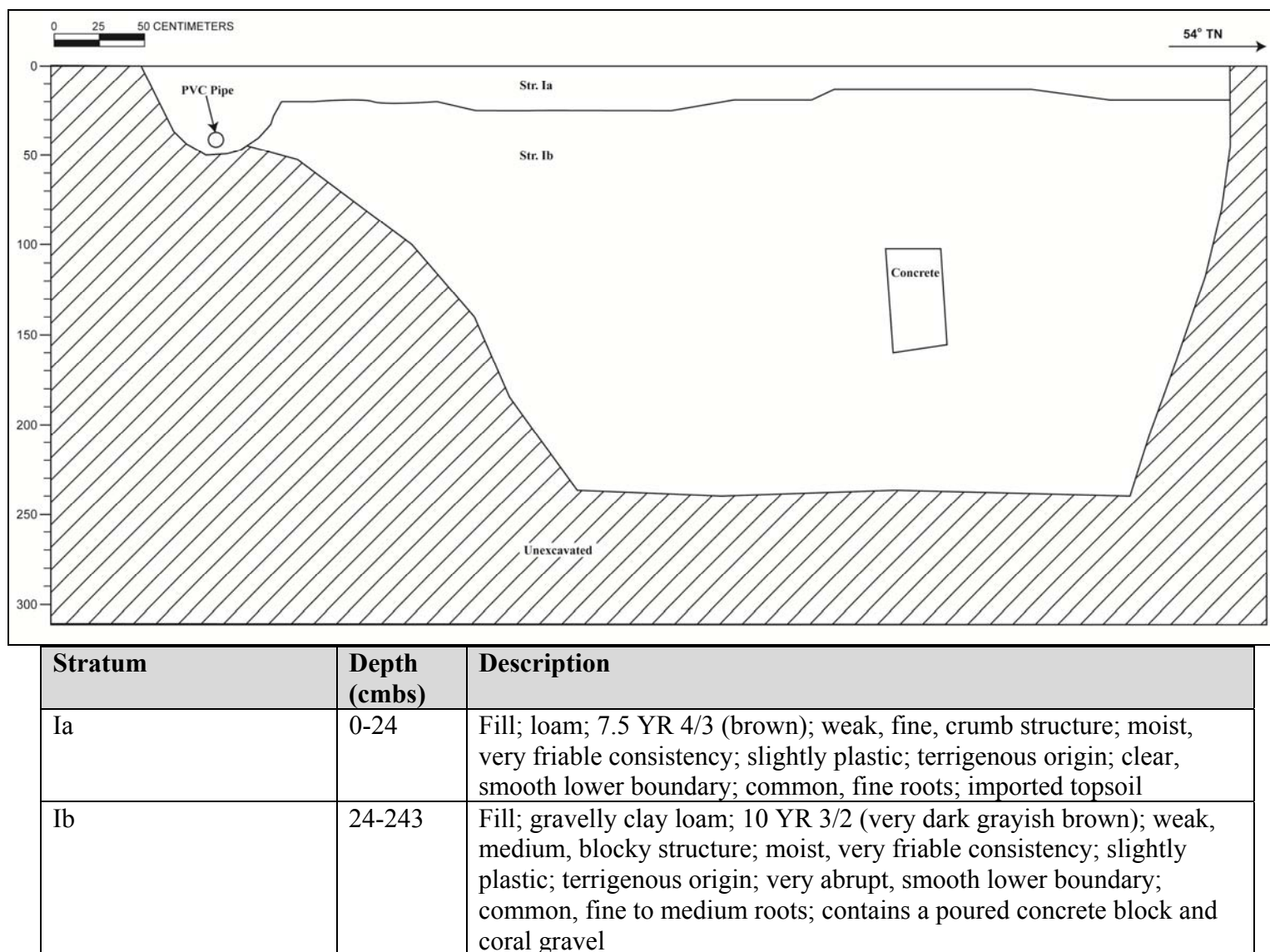


Figure 90. Test Excavation 7 west profile and stratigraphic description

7.2.8 Test Excavation 8

Ahupua'a:	Hālawā
LCA :	Ali'i Award: LCA #s 8516B & 7712 (to Grace Kama'iku'i Young Rooke and Kekūanaō'a)
TMK #:	9-9-002: 004
Street:	Kamehameha Highway (<i>mauka</i> or east of highway)
Owner:	USA
Elevation:	9.2 m
UTM:	610446.9139 mE 2361498.759 mN
Max Length/ Width/ Depth	6.2 m/ 0.8 m /0.55 m
Orientation:	180/360 TN
Targeted Project Component:	Pearl Harbor Naval Base Station (proposed locations of Train Control and Communications Room)
USDA Soil Designation:	Hanalei silty clay (HnB)

Setting: Test Excavation 8 (T-008) was located in a field near a subdivision on the southeast corner of the intersection of Kamehameha Highway and Radford Drive, with level surface to the north, east, and west (see Figure 82, Figure 86, Figure 87, and Figure 91). Sixteen meters to the south of the excavation, the surface begins to rise as it approaches a rock ledge. At 10 meters south, the ledge rises to approximately 3.5 meters above the surface of the excavation.

Summary of Background Research and Land Use: The immediate vicinity of T-007, T-008, T-009, T-010 and T-011 is a soil swale between two easterly extending ridges of the Āliamanu and Makalapa craters Rock land outcrops (see Figure 5). The 1873 Lyons map of Pearl Lochs (Figure 11) shows a small named rivulet flowing from this swale into the Southeast Loch of Pearl Harbor. A north/south trending trail is also shown in this immediate area. A 1933 US Army War Department quad map (Figure 16) shows an irrigation ditch descending from a reservoir located 500 m to the east bifurcating in the immediate vicinity with both ditches descending in a generally southwesterly direction. This area appears to have been a part of Honolulu Plantation sugar cane "Field 1" by 1935 (see Figure 17). A 1943 War Department Aiea quad map (Figure 19) shows substantial housing development adjacent to the southwest and east.

Documentation Procedures: Decomposing bedrock was encountered at 13 cmbs beneath Stratum Ib. The shallow depth of bedrock within T-008 is consistent with other excavation in the vicinity.

Stratigraphic Summary: The stratigraphy, presented in Figure 92 and Figure 93, consisted of grass sod (Stratum Ia) and coral fill (Stratum Ib) overlying decomposed basalt bedrock (Stratum IIa) grading into solid basalt bedrock (Stratum IIb). The natural deposit of decomposing bedrock (IIa) was encountered at 13 cmbs and extended to a maximum depth of 55 cm. The previous land surface was likely graded in order to landscape the area by laying sod grass in loam over coral fill.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-008 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 110 cmbs (see Appendix E for more details).

Summary: Stratigraphy present within T-008 consisted of grass sod (Stratum Ia) and coral fill (Stratum Ib) overlying decomposed basalt bedrock (Stratum IIa) and solid basalt bedrock (Stratum IIb). The underlying solid bedrock appears to be descending to the north as it extends from the rock ledge to the south. No cultural resources were encountered.



Figure 91. Photograph of Airport Section, T-008, general location, Radford Drive in background, view to north



Figure 92. Photograph of Airport Section, T-008 east profile view to east

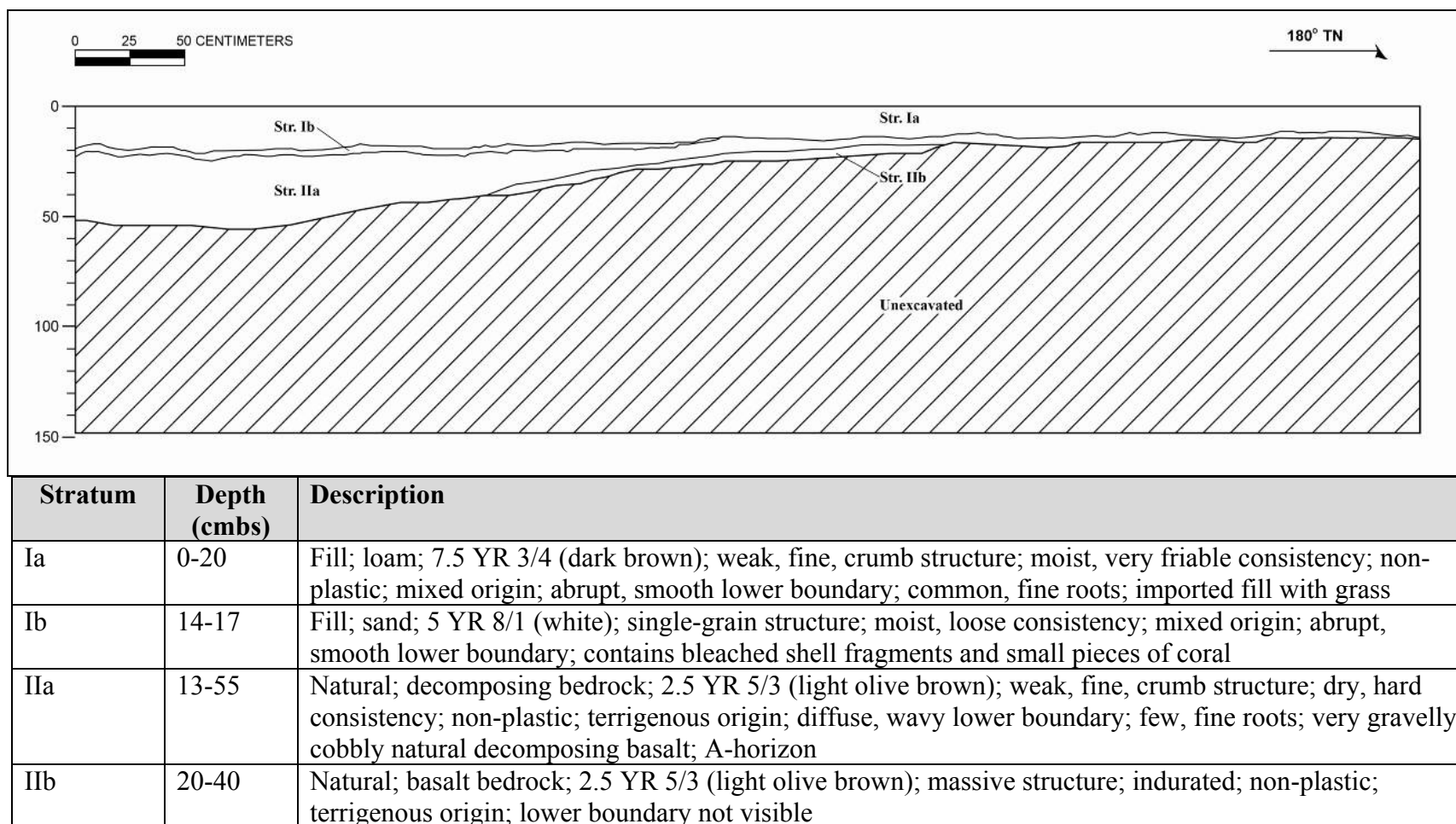


Figure 93. T-008 east profile and stratigraphic description

7.2.9 Test Excavation 9

Ahupua'a:	Hālawā
LCA :	Ali'i Award: LCA #s 8516B & 7712 (to Grace Kama'iku'i Young Rooke and Kekūanaō'a)
TMK #:	9-9-002: 004
Street:	Kamehameha Highway (<i>mauka</i> or east of highway)
Owner:	State DOT/USA
Elevation:	8.7 m
UTM:	610416.3218 mE 2361490.985 mN
Max Length/ Width/ Depth	5.3 m excavated (6.2 m grass removed)/ 1.35 m/ 0.5 m
Orientation:	45/225 TN
Targeted Project Component:	Pearl Harbor Naval Base Station (proposed elevator shaft)
USDA Soil Designation:	Hanalei silty clay (HnB)

Setting: Test Excavation 9 (T-009) was located in a field near a subdivision on the southeast corner of the intersection of Kamehameha Highway (about 10 m east of the highway) and Radford Drive, with level surface to the north, east, and west (see Figure 82, Figure 86, Figure 87, and Figure 94). About 4 m south, the land begins to rise as it approaches a modern rock wall that is approximately 12 m south of the excavation. This wall retains soil for the sub-division located at a higher level.

Summary of Background Research and Land Use: The immediate vicinity of T-007, T-008, T-009, T-010 and T-011 is a soil swale between two easterly extending ridges of the Āliamanu and Makalapa craters Rock land outcrops (see Figure 5). The 1873 Lyons map of Pearl Lochs (Figure 11) shows a small named rivulet flowing from this swale into the Southeast Loch of Pearl Harbor. A north/south trending trail is also shown in this immediate area (see Figure 11). A 1933 US Army War Department quad map (Figure 16) shows an irrigation ditch descending from a reservoir located 500 m to the east bifurcating in the immediate vicinity with both ditches descending in a generally southwesterly direction. This area appears to have been a part of Honolulu Plantation sugar cane "Field 1" by 1935 (see Figure 17). A 1943 War Department Aiea quad map (Figure 19) shows substantial housing development adjacent to the southwest and east.

Documentation Procedures: T-009 contained a clay loam fill (Ib) underlying the grass filled upper-most fill layer (Ia). A decomposing basalt bedrock layer (II), which has been identified in nearby excavations is present at the base of T-009. The only cultural material found consisted of a few glass fragments in either Ia or Ib and a PVC water pipe present in Stratum Ib.

Stratigraphic Summary: The stratigraphy, presented in Figure 95 and Figure 96, consisted of sod with grass (Stratum Ia), and imported clay loam fill (Stratum Ib) overlying decomposing bedrock (II). The Stratum II bedrock was formed from volcanic tuff deposits from the Makalapa and/or Āliamanu events.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps does not clearly indicate any linear features although a utility was encountered during excavation. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-009 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. A utility was encountered during excavation but was not observed in the GPR profile. The maximum depth of clean signal return was approximately 110 cmbs (see Appendix E for more details).

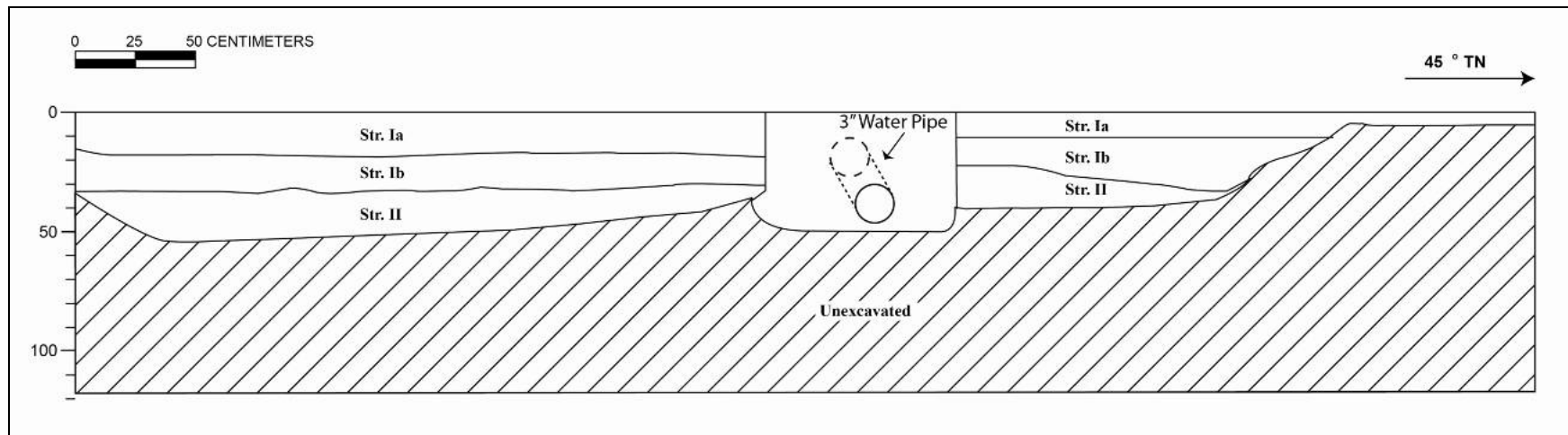
Summary: The stratigraphy consisted of fill (Stratum Ia and Ib) overlying decomposing bedrock (Stratum II). The only cultural material found consisted of a few glass fragments in Stratum Ia and Ib and an abandoned PVC waterline pipe in Stratum Ib. No cultural resources were identified.



Figure 94. Photograph of Airport Section, T-009, general location, view to southwest



Figure 95. Photograph of Airport Section, T-009, view to northwest



Stratum	Depth (cmbs)	Description
Ia	0-17	Fill; loam; 7.5 YR 3/4 (dark brown); weak, fine, crumb structure; moist, very friable consistency; non plastic; terrigenous origin; clear, smooth lower boundary; many, very fine to fine roots; imported fill with grass
Ib	15-31	Fill; clay loam; 2.5 YR 3/4 (dark reddish brown); weak, fine, crumb structure; moist, very friable consistency; slightly plastic; clear, smooth lower boundary; common, very fine to fine roots; imported fill likely used for leveling former land surface
II	31-50	Natural; decomposing bedrock; 2.5 YR 5/3 (light olive brown); very gravelly, weak, fine, crumb structure; hard consistency; non-plastic; terrigenous origin; lower boundary not visible; deposit consisting of very gravelly decomposing natural tuff

Figure 96. T-009 northwest profile and stratigraphic description

7.2.10 Test Excavation 10

Ahupua'a:	Hālawā
LCA :	Ali'i Award: LCA #s 8516B & 7712 (to Grace Kama'iku'i Young Rooke and Kekūanaō'a)
TMK #:	9-9-002: 004
Street:	Kamehameha Highway (<i>mauka</i> or east of highway)
Owner:	State USA
Elevation:	9.6 m
UTM:	610461.0399 mE 2361502.71 mN
Max Length/ Width/ Depth	6.25 m/ 0.9 m/ 0.55 m
Orientation:	351/171 TN
Targeted Project Component:	Pearl Harbor Naval Base Station (proposed Systems Site # 25)
USDA Soil Designation:	Hanalei silty clay (HnB)

Setting: Test Excavation 10 (T-010) was located in a large open grassy field near Tarawa Drive, on the southeast corner of the intersection of Kamehameha Highway and Radford Drive (see Figure 82, Figure 86, Figure 87 and Figure 97). The excavation surface was level with the surrounding land surface. A large exposed bedrock slope is located approximately 15.24 m to the south of the excavation.

Summary of Background Research and Land Use: The immediate vicinity of T-007, T-008, T-009, T-010 and T-011 is a soil swale between two easterly extending ridges of the Āliamanu and Makalapa craters Rock land outcrops (see Figure 5). The 1873 Lyons map of Pearl Lochs (see Figure 11) shows a small unnamed rivulet flowing from this swale into the Southeast Loch of Pearl Harbor. A north/south trending trail is also shown in this immediate area (see Figure 11). A 1933 US Army War Department quad map (Figure 16) shows an irrigation ditch descending from a reservoir located 500 m to the east bifurcating in the immediate vicinity with both ditches descending in a generally southwesterly direction. This area appears to have been a part of Honolulu Plantation sugar cane "Field 1" by 1935 (see Figure 17). A 1943 War Department Aiea quad map (see Figure 19) shows substantial housing development adjacent to the southwest and east.

Documentation Procedures: Test Excavation 10 revealed a very thin layer of top soil overlying extremely gravelly sand and in-situ bedrock formed of decomposing tuff.

Stratigraphic Summary: The stratigraphy, presented in Figure 98 and Figure 99, consisted of imported topsoil fill (Stratum I) overlying extremely gravelly sand with sparse cultural material (Stratum II), and decomposing bedrock (Stratum III). Stratum II is considered to be a possible remnant former land surface (A-horizon) that has been horizontally truncated and leveled. The Stratum III bedrock was formed from volcanic tuff deposits from the Makalapa and/or Āliamanu events.

Artifacts Discussion: Four highly oxidized metal fragments, possibly nails, were recovered from Stratum II of T-010 at 26-30 cmbs.

Features Discussion: No features were observed.

Faunal Remains Discussion: Two fragments of *Pinctada radiata* (1.3 g) and an unidentified bivalve (0.7 g) were recovered from a 35-liter screened sample of Stratum II that was collected at a depth of 26-30 cmbs. The presence of a total of only 2.0 g of shell material within the 35-liter sample indicates that, while cultural material is present within Stratum II, this material is extremely sparse and not indicative of a discernible activity area.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-010 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 110 cmbs (for more details see Appendix E).

Summary: Excavation of T-010 encountered a thin topsoil fill layer (Stratum I) overlying extremely gravelly sand (Stratum II), and bedrock formed of decomposing tuff (Stratum III). Four highly oxidized nails, and a total of 2.0 g of marine shell were collected from Stratum II during excavation and subsequent screening of a 35-liter sediment sample. Stratum II is considered to be a possible remnant former land surface (A-horizon) that has been horizontally truncated and leveled. While cultural material was documented within Stratum II, the material was extremely sparse and not considered to be indicative of an activity area or cultural resource. No cultural resources were identified within T-010.



Figure 97. Photograph of Airport Section, T-010, general location Radford Drive in background, view to north



Figure 98. Photograph of Airport Section, T-010 east profile, view to east

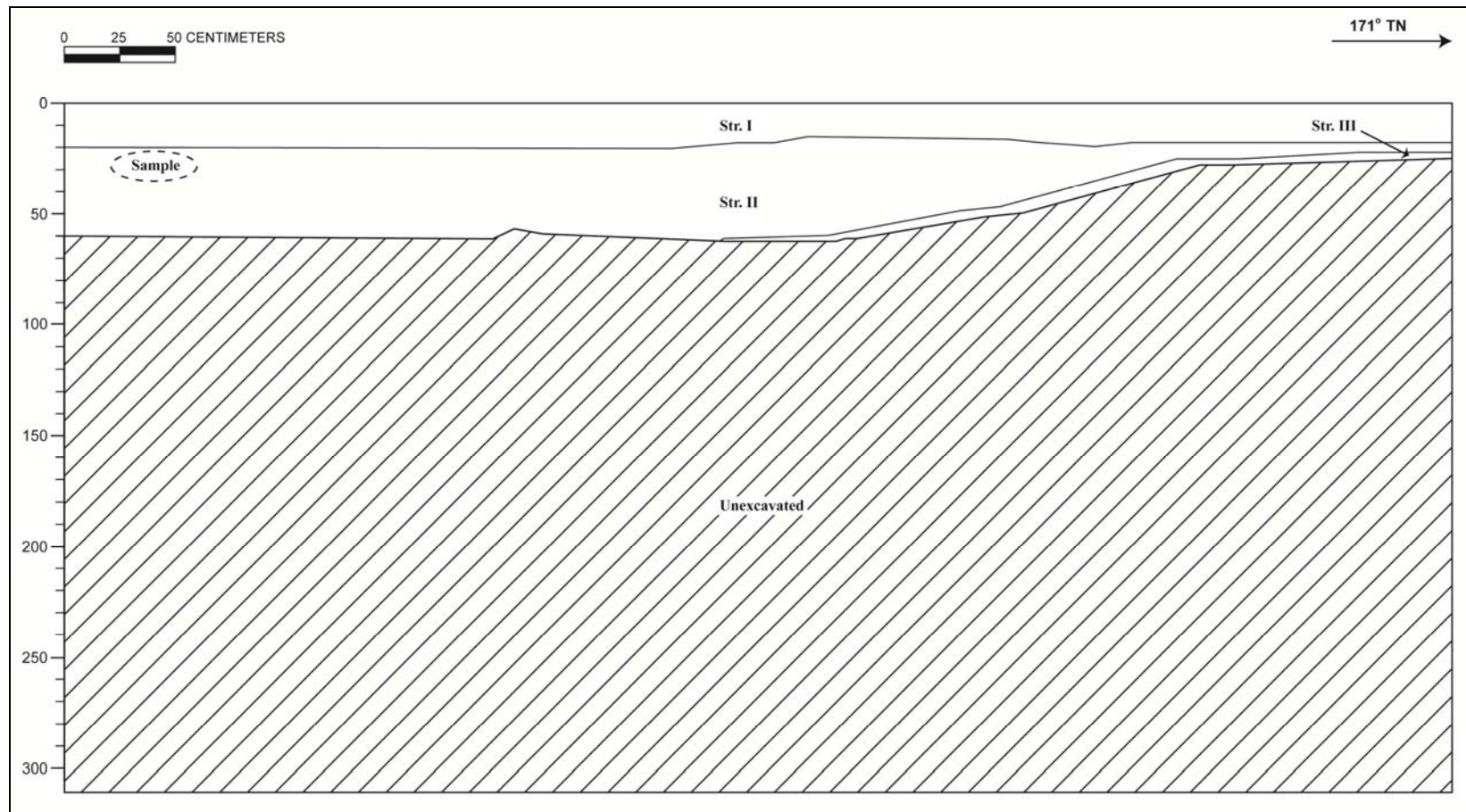


Figure 99. T-010 east profile (above) and stratigraphic description (below)

Stratum	Depth (cmts)	Description
I	0-20	Fill; clay loam; 7.5 YR 4/2 (brown); weak, fine structure; moist, very friable consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary; common, fine roots; imported topsoil with fertilizer
II	15-55	Natural; extremely gravelly sand; 2.5 Y 5/3 (light olive brown); weak, fine, crumb structure; dry, hard consistency; non-plastic; terrigenous origin; diffuse, wavy lower boundary; many, fine roots; contains basalt gravel, four highly oxidized metal nail fragments, two fragments of <i>Pinctada radiata</i> and an unidentified bivalve; remnant former land surface (A-horizon)
III	20-55	Natural; bedrock; 2.5 Y 5/3 (light olive brown); massive structure; dry, very hard consistency; non-plastic; terrigenous origin; lower boundary not visible; massive ash deposit; B horizon

7.2.11 Test Excavation 11

Ahupua'a:	Hālawā
LCA :	Ali'i Award: LCA #s 8516B & 7712 (to Grace Kama'iku'i Young Rooke and Kekūanaō'a)
TMK #:	9-9-002: 004
Street:	Kamehameha Highway (<i>mauka</i> or east of highway)
Owner:	USA
Elevation:	8.85 m
UTM:	610426.2209 mE 2361488.626 mN
Max Length/ Width/ Depth:	6.1 m/ 0.8 m/ 0.50 m
Orientation:	81/261 TN
Targeted Project Component:	Pearl Harbor Naval Base Station (proposed escalator pit)
USDA Soil Designation:	Hanalei silty clay (HnB)

Setting: Test Excavation 11 (T-011) was located in the southeast corner at the intersection of Radford Drive and Kamehameha Highway (see Figure 82, Figure 86, Figure 87, and Figure 100). The excavation was situated in a field with level surface to the north, east, and west. Approximately 20 m west is Kamehameha Highway. The land begins to rise approximately 4.3 m to the south as it approaches a natural rock ledge that begins 8 m south of the excavation. At 10 m, the ledge is about 3.5 m above the surface of the excavation. The land continues to rise as it approaches the above subdivision. T-011 was shifted west to avoid a possible utility. No were utilities observed during excavation.

Summary of Background Research and Land Use: The immediate vicinity of T-007, T-008, T-009, T-010 and T-011 is a soil swale between two easterly extending ridges of the Āliamanu and Makalapa craters Rock land outcrops (see Figure 5). The 1873 Lyons map of Pearl Lochs (Figure 11) shows a small named rivulet flowing from this swale into the Southeast Loch of Pearl Harbor. A north/south trending trail is also shown in this immediate area. A 1933 US Army War Department quad map (Figure 16) shows an irrigation ditch descending from a reservoir located 500 m to the east bifurcating in the immediate vicinity with both ditches descending in a generally southwesterly direction. This area appears to have been a part of Honolulu Plantation sugar cane "Field 1" by 1935 (see Figure 17). A 1943 War Department Aiea quad map (Figure 19) shows substantial housing development adjacent to the southwest and east.

Documentation Procedures: T-011 was shifted west to avoid a possible utility (see station layout map). No utilities were observed within the relocated area.

Stratigraphic Summary: The stratigraphy, presented in Figure 101 and Figure 102, consisted of imported topsoil fill (Stratum I) overlying natural extremely gravelly silt (Stratum II) and decomposing bedrock (Stratum III). Stratum II is considered to be a possible remnant former land surface (A-horizon) that has been horizontally truncated and leveled. Stratum III (bedrock)

was formed from volcanic tuff deposits from the Makalapa and/or Āliamanu events. No cultural material was observed.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude GPR slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-011 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 110 cmbs (See Appendix E for more details).

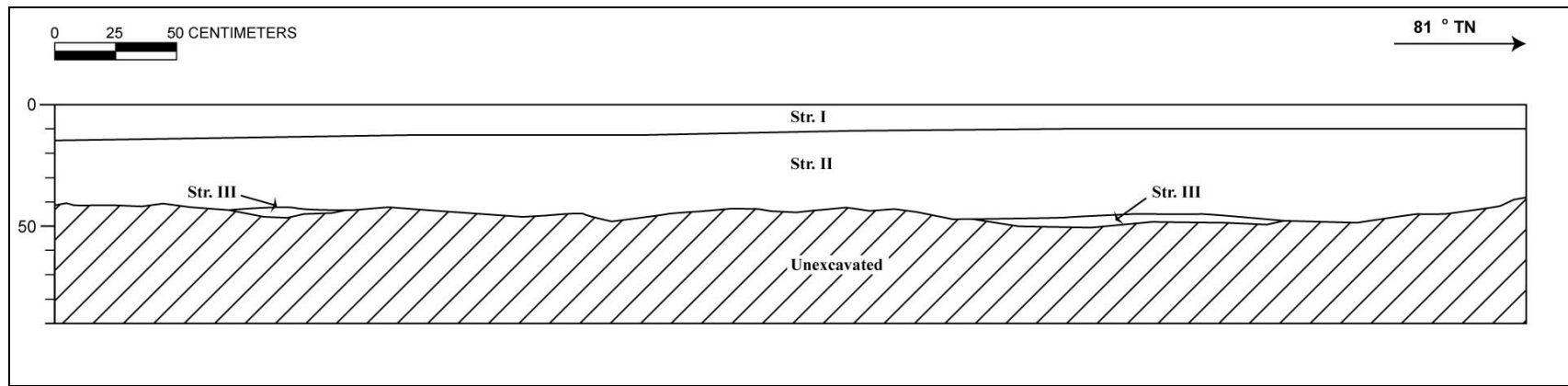
Summary: Excavation encountered one fill layer (Stratum I) over natural extremely gravelly silt (Stratum II) and volcanic tuff bedrock (Stratum III). The level lower boundary of Stratum I suggests the natural surface of Stratum II may have been graded prior to landscaping. No cultural resources were identified.



Figure 100. Photograph of Airport Section, T-011, general location, view to northeast, Test Excavation 8, Test Excavation 10 and Radford Drive in background



Figure 101. Photograph of Airport Section, T-011, north profile, view to north



Stratum	Depth (cmbs)	Description
I	0-15	Fill; clay loam; 7.5 YR 3/4 (dark brown); weak, fine structure; moist, very friable consistency; non-plastic; abrupt, smooth lower boundary; imported fill with grass
II	12-45	Natural; extremely gravelly silt; 2.5 Y 5/3 (light olive brown); weak, fine, crumb structure; dry, hard consistency; non-plastic; terrigenous origin; diffuse, wavy lower boundary; few, fine roots; remnant former land surface (A-horizon)
III	45- 50	Natural; tuff; 2.5 Y 5/3 (light olive brown); massive structure; dry, extremely hard consistency; non-plastic; lower boundary not visible; volcanic tuff; B-horizon

Figure 102. T-011 north profile and stratigraphic description

7.2.12 Test Excavation 12

Ahupua'a:	Hālawā
LCA :	Ali'i Award: LCA #s 8516B & 7712 (to Grace Kama'iku'i Young Rooke and Kekūanaō'a)
TMK #:	9-9-002:
Street:	Kamehameha Highway
Owner:	State DOT
Elevation:	14.0 m
UTM:	610447.5896 mE 2361207.381
Max Length/ Width/ Depth	3.04 m/ 0.28 m/ 0.78 m
Orientation:	159/339 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Makalapa Clay (MdB)

Setting: Test Excavation 12 (T-012) was located in the median between Kamehameha Highway and a highway on-ramp on a gentle slope (see Figure 103 and Figure 104). The excavation surface was level with the surrounding land.

Summary of Background Research and Land Use: T-012 is understood to be located in Hālawā of 'Ewa just north of the boundary with Moanalua of Kona District (see Figure 12). Early maps indicate little activity in this area. This area appears to have been a part of Honolulu Plantation sugar cane "Field 2" by 1935 (see Figure 17). A 1943 War Department Aiea quad map (Figure 19) shows substantial housing development adjacent to the west and east.

Documentation Procedures: A utility was identified in the excavation location, which was widened from 0.9 m to 1.2 m in order to expose relatively undisturbed stratigraphy adjacent to the utility area. The topmost asphalt layer had been pre-cut. An excavator scraped off the asphalt, crushed coral base course and shallow gravel fill layer, then hit hard material. The archaeologists had the excavator scrape through to ascertain whether the substrate was indurated. The excavator could hammer/scrape through, but it was ascertained that the BOE was natural basalt bedrock.

Stratigraphic Summary: The stratigraphy, presented in Figure 105 and Figure 106, consisted of asphalt (Stratum Ia), crushed coral base course (Stratum Ib), and extremely gravelly silt loam (Stratum Ic) overlying decomposed volcanic tuff bedrock (Stratum II). The stratigraphy observed in T-012 is inconsistent with the USDA soil designation of Makalapa Clay (MdB). A surface exposure of volcanic tuff, likely deposited by Makalapa Crater, was observed in an adjacent road cut.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of GPR amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 75 cmbs.

GPR depth profiles for T-012 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 75 cmbs (see Appendix E for more details).

Summary: The stratigraphy present within T-012 consisted of asphalt (Stratum Ia) overlying fill deposits (Stratum Ib and Ic), and decomposed volcanic tuff bedrock (II). A utility line was identified in the initial excavation location, which was widened to facilitate excavation adjacent to the utility. No cultural resources were observed.

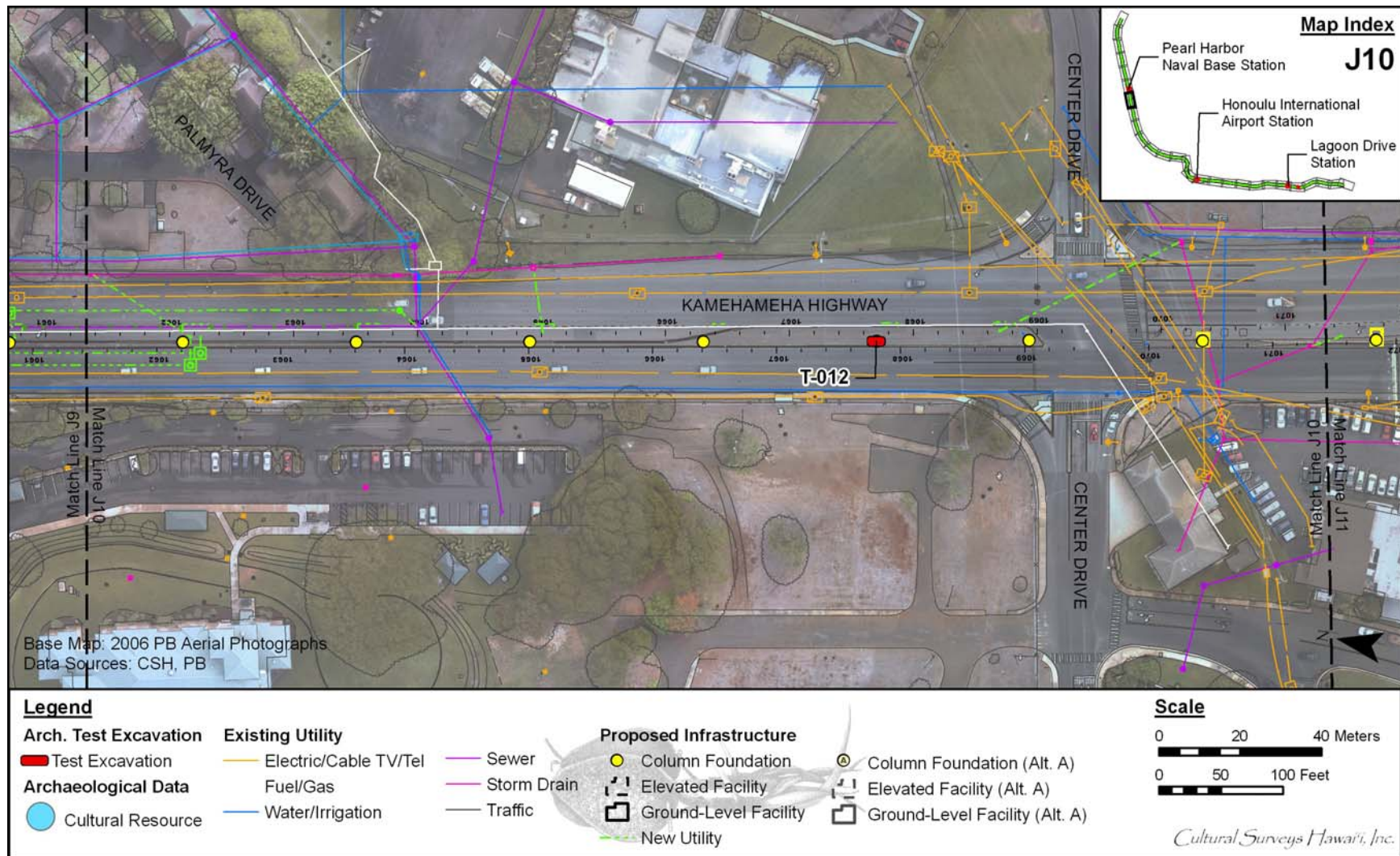


Figure 103. Map Sheet J 10, showing the location of T-0012 along Kamehameha Highway just north of Center Drive



Figure 104. Photograph of Airport Section, T-012, general location, view to north



Figure 105. Photograph of Airport Section, T-012, general view of profile, view to west

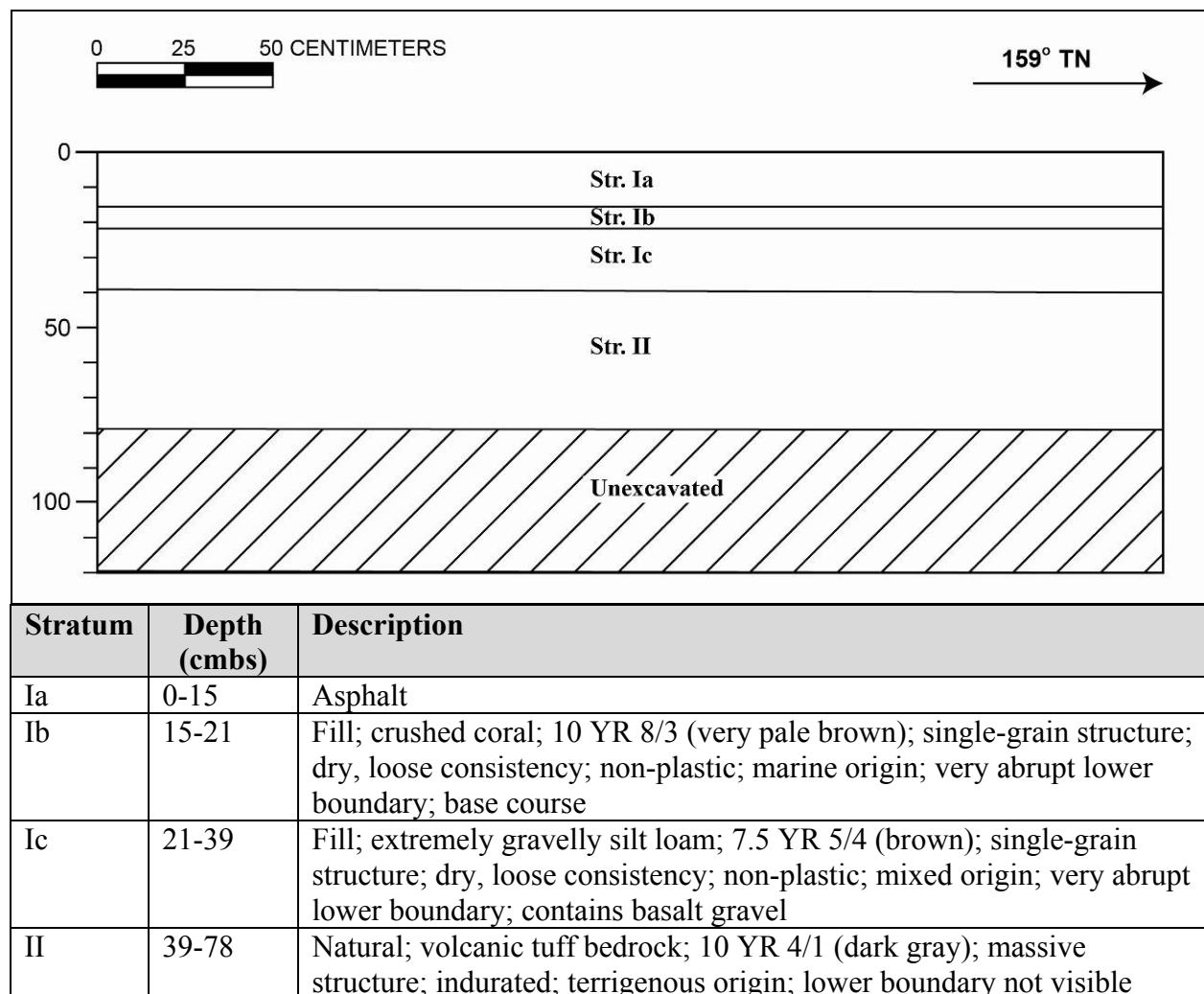


Figure 106. T-012 west profile and stratigraphic description

7.2.13 Test Excavation 13

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-010
Street:	Makai Frontage Road
Owner:	State DOT
Elevation:	18.5 m
UTM:	610485.8091 mE 2361005.914 mN
Max Length/ Width/ Depth	3.0 m/ 1.0 m/ 1.95
Orientation:	156/336 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Makalapa Clay (MdB)

Setting: Test Excavation 13 (T-013) was located to the west of Makai Frontage Road near where it merges with Ramp KN (see Figure 107 and Figure 108). The excavation area is level with the highway surface.

Summary of Background Research and Land Use: T-013 is located within Moanalua Ahupua'a just south of the border with Hālawā Ahupua'a of 'Ewa District (see Figure 12). Early maps indicate little activity in this area. This area appears to have been a part of Honolulu Plantation sugar cane "Field 2" by 1935 (see Figure 17). A 1943 War Department Aiea quadrangle map (Figure 19) shows substantial housing development southwest of T-013.

Documentation Procedures: The excavation was offset slightly in order to avoid nearby trees. No excavations were attempted within one meter of standing trees at this location, in an effort to minimize excavation or disturbance of subsurface tree root systems and tap roots. Bedrock was encountered at 145 cmbs. The excavation was then documented and photographed.

Stratigraphic Summary: The stratigraphy, presented in Figure 109 and Figure 110, consisted of silt loam topsoil (Stratum Ia) and extremely cobbly sandy loam (Stratum Ib) overlying natural basalt bedrock (Stratum II). The natural surface (Stratum II) was encountered at 185 cmbs. A tree root and a utility line were observed near the lower boundary of Stratum Ia. The stratigraphy present within T-013 does not conform to the USDA soil survey designation of Makalapa Clay (MdB).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected.

GPR Discussion: A review of amplitude slice maps does not clearly indicate any linear features although a utility and tree root were encountered during excavation. Reflectivity is relatively

uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 25-50 cmbs.

GPR depth profiles for T-013 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 35 cmbs. Two anomalies were indicated on the GPR profile which corresponded to the tree root and utility encountered during excavation. The maximum depth of clean signal return was approximately 100 cmbs (see Appendix E for more details).

Summary: The stratigraphy consisted of two layers of fill (Stratum Ia and Ib) overlying bedrock (Stratum II). Major development in this area occurred in the 1940s and 1950s. Stratum Ib was possibly associated with the development of the highway. No cultural resources were identified.

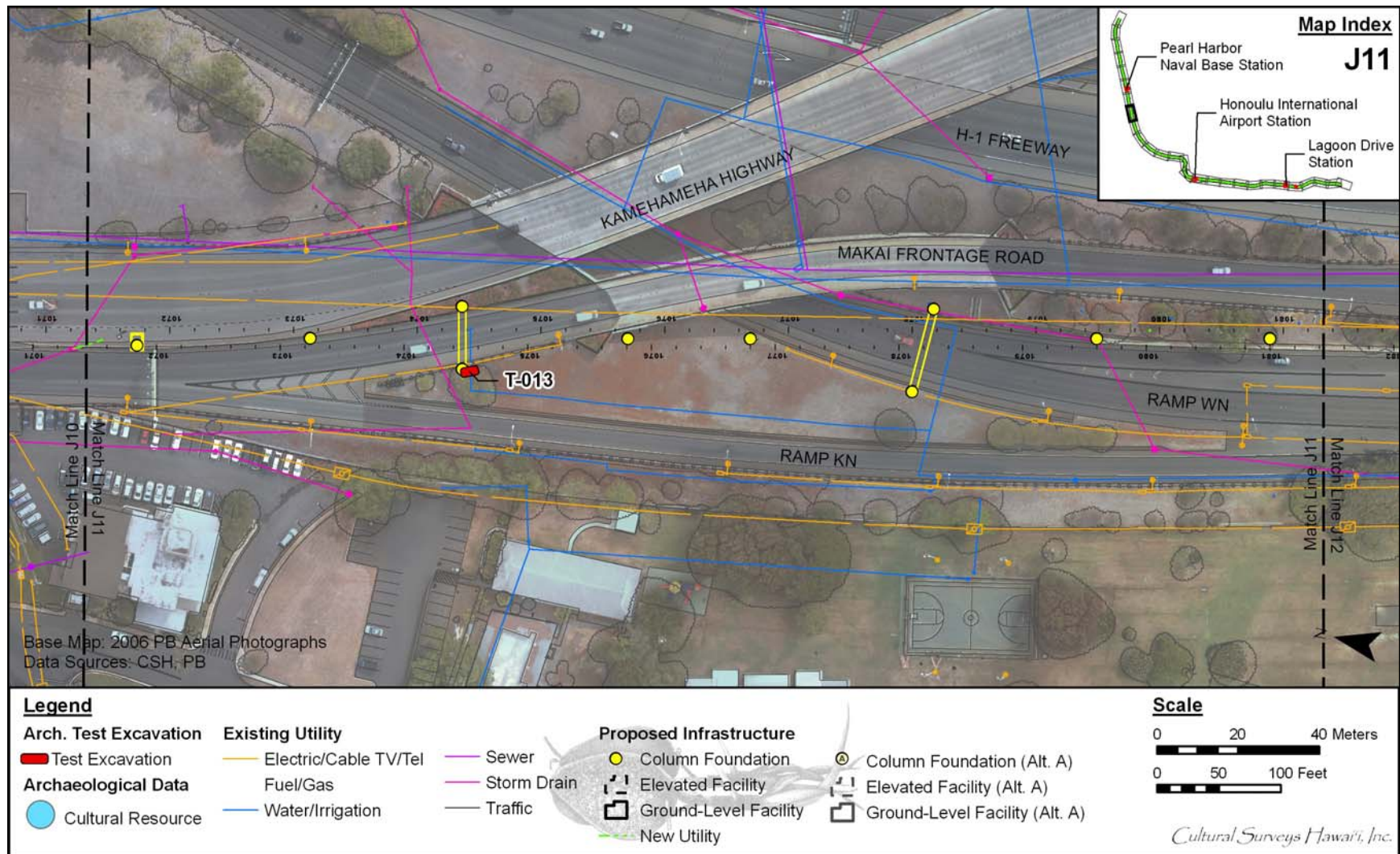


Figure 107. Map Sheet J 11, showing the location of T-013 along Makai Frontage Road



Figure 108. Photograph of Airport Section, T-013, general location, view to southeast



Figure 109. Photograph of Airport Section, T-013, general view of profile, view to east

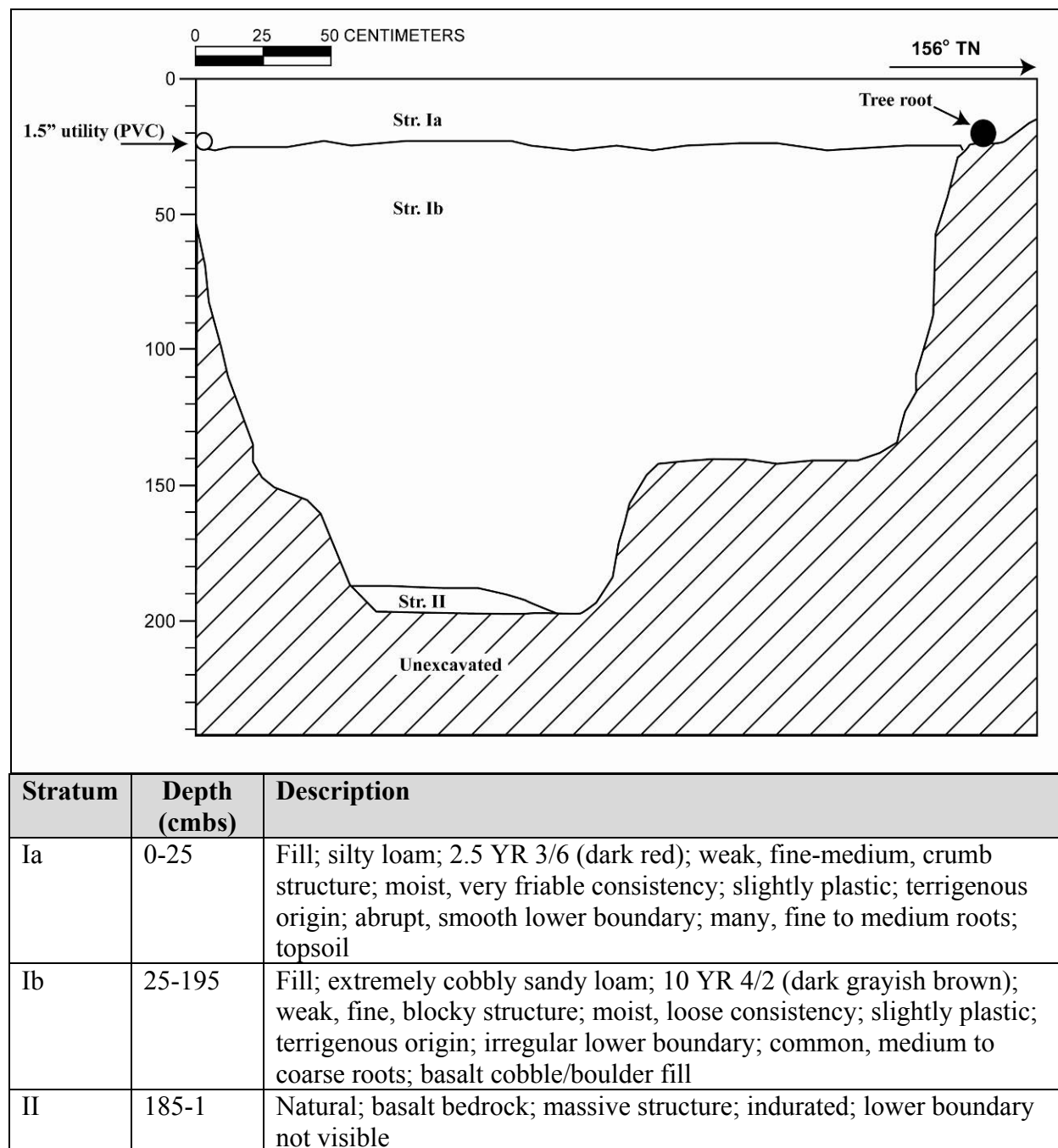


Figure 110. T-013 east profile and stratigraphic description

7.2.14 Test Excavation 14

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-010
Street:	Between H-1 Freeway (east or <i>mauka</i>) and Makai Frontage Road (west or <i>makai</i>)
Owner:	State DOT
Elevation:	15.5 m
UTM:	610605.1409 mE 2360580.243 mN
Max Length/ Width/ Depth	4.1 m/ 1.1 m/ 2.90 m
Orientation:	70/250 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Makalapa Clay (MdB)

Setting: Test Excavation 14 (T-014) is on a slight slope inclined to the west located in the median off the highway (H1) near the cutoff to the airport east bound (see Figure 111 and Figure 112).

Summary of Background Research and Land Use: Early maps show the vicinity of T-014 as undeveloped. The Beasley and Taylor 1899 map (Figure 12) shows the OR&L in the immediate area by that time. The Honolulu Plantation map of circa 1935 (Figure 17) shows the vicinity as in "Field 11" sugar cane production. By 1943 (Figure 19) there was very substantial development of the Hickam Air Force Base lands to the south but the immediate vicinity was still relatively undeveloped.

Documentation Procedures: T-014 was rotated due to concerns for tree preservation. Excavation came to a stop at 290 cmbs (BOE). Archaeologists entered the excavation with shoring and were able to confirm that all strata were consistent with fill sediments.

Stratigraphic Summary: The stratigraphy, presented in Figure 113 and Figure 114, consisted of loam fill (Stratum Ia), extremely gravelly cobbly loam fill (Stratum Ib), and gravelly cobbly sandy loam fill (Stratum Ic) to the base of excavation at 290 cmbs. No natural sediments were observed. The stratigraphy observed within T-014 does not conform to the USDA soil survey designation of MdB (Makalapa clay).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and

decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 25 cmbs and increases again at 75 cmbs.

GPR depth profiles for T-014 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs and again around 60 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 125 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-014 consisted of loam fill (Stratum Ia), extremely gravelly cobbly loam fill (Stratum Ib), and gravelly cobbly sandy loam fill (Stratum Ic) to the base of excavation at 290 cmbs. The stratigraphy observed within T-014 does not conform to the USDA soil survey designation of MdB (Makalapa clay). No cultural resources were identified.

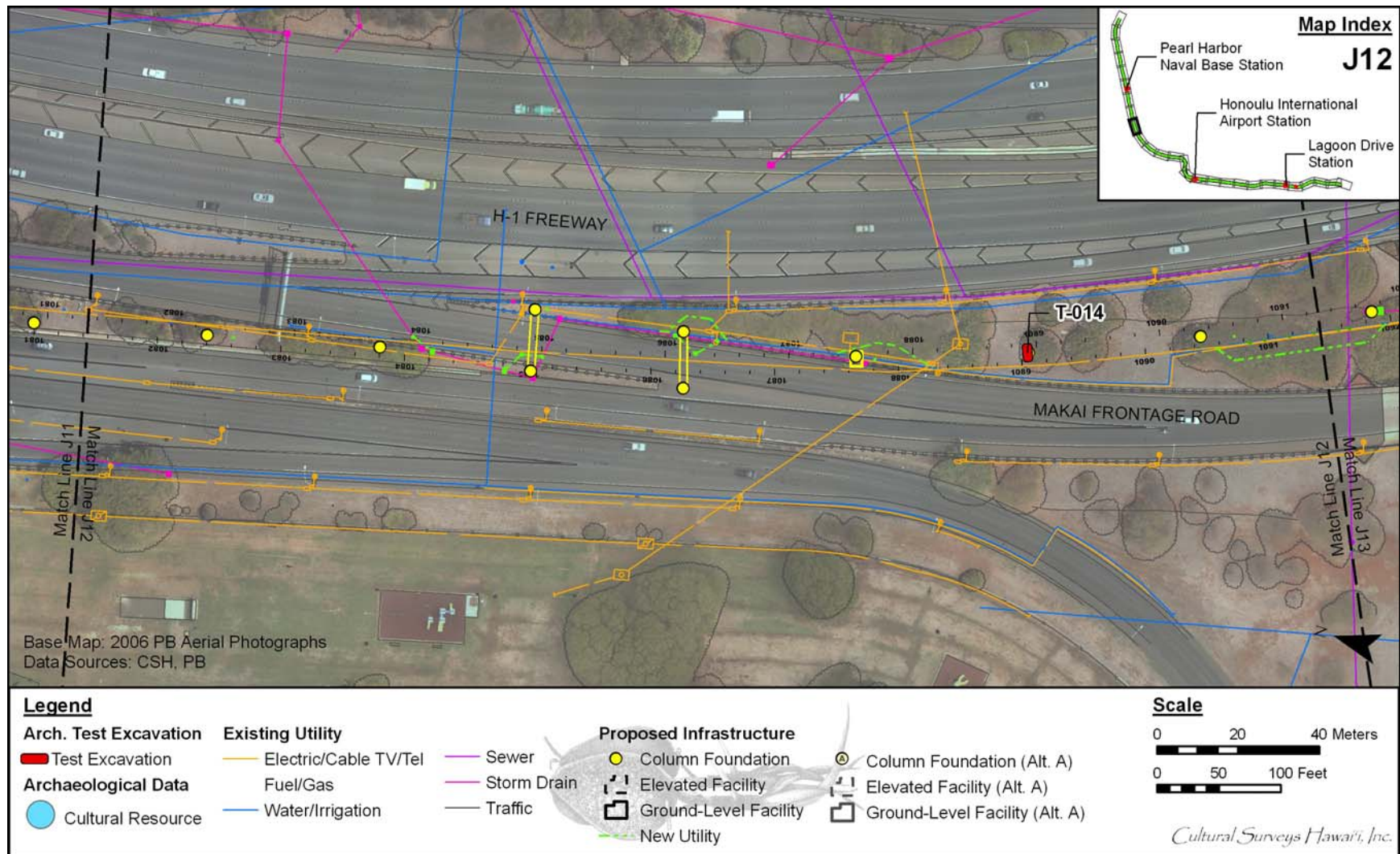


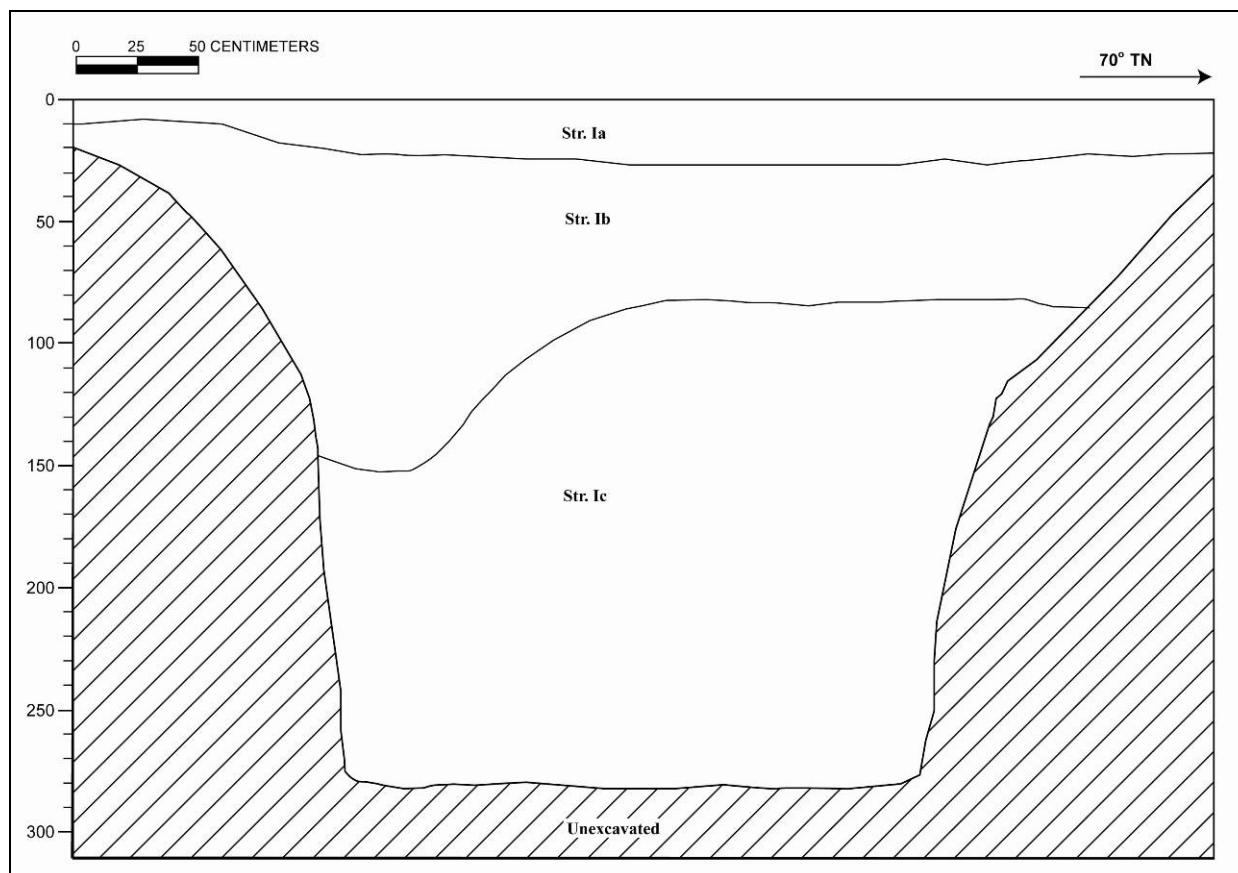
Figure 111. Map Sheet J 12, showing the location of T-014 west (*makai*) of the H-1 Freeway and east (*mauka*) of Makai Frontage Road



Figure 112. Photograph of Airport Section, T-014, general location, view to south



Figure 113. Photograph of Airport Section, T-014, general view of profile, view to ENE



Stratum	Depth (cmbs)	Description
Ia	0-22	Fill; loam; 5 YR 3/4 (reddish brown); weak, fine, crumb structure; moist, friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; common, medium to coarse roots
Ib	22	Fill; gravelly cobbly loam; 5 YR 3/3 (dark reddish brown); weak, medium, blocky structure; friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few, fine to medium roots; contains coral, angular basalt, asphalt, one concrete block
Ic	290	Fill; gravelly cobbly sandy loam; 5 YR 4/3 (reddish brown); fine, blocky structure; moist, friable consistency; non-plastic; mixed origin; lower boundary not visible; few, fine roots; contains basalt and coral cobbles, asphalt, angular cobbles

Figure 114. T-014 north profile and stratigraphic description

7.2.15 Test Excavation 15

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-010
Street:	Between H-1 Freeway (east or <i>mauka</i>) and Makai Frontage Road (west or <i>makai</i>)
Owner:	State DOT
Elevation:	13.25 m
UTM:	610677.4605 mE 2360435.32 mN
Max Length/ Width/ Depth	3.04 m/ 1.10 m/ 2.90 m
Orientation:	314/134 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Makalapa Clay (MdB)

Setting: Test Excavation 15 (T-015) was located in a grassy portion of the median strip between Makai Frontage Road and the H-1 Freeway (see Figure 115 and Figure 116).

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area was largely underdeveloped pasture land. By the 1900s the railway allowed development of plantation, largely sugar. T-015 appears to be located within former sugar cane "Field 10" of the Honolulu Plantation (see Figure 17). This portion of the HHTCTP corridor goes through an area expected to have a low probability of cultural resources. Ultimately major development was seen in 1930s-1940s (Figure 19) for military purposes.

Documentation Procedures: The excavation sidewalls were fairly unstable, consisting of unconsolidated fill material with loosely held cobbles/boulders. Uneven sidewalls with loose stratigraphy and overhangs created by falling boulders made it impossible to properly shore. At 286 cmbs the operator continued scraping at a hard surface. Inspection of pieces of substrate from the bucket scoop revealed fragments of asphalt. An attempt was made to scrape past the asphalt but excavation was terminated at a depth of 290 cmbs. Archaeologists did not enter the excavation due to safety concerns. The excavation was documented and photographed.

Stratigraphic Summary: The stratigraphy, presented in Figure 117 and Figure 118, consisted of sandy silt topsoil (Stratum Ia), sandy clay loam (Stratum Ib), very gravelly/cobbly sandy silt (Stratum Ic), very cobbly/stony sandy silt (Stratum Id), and buried asphalt (Stratum II). The stratigraphy does not conform to the USDA soil survey designation of Makalapa clay (MdB).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-015 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs and again around 75 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 125 cmbs (see Appendix E for more details).

Summary: Excavation of T-015 proceeded to a depth of 290 cmbs. Strata observed consisted of topsoil (Stratum Ia) and fill deposits (Stratum Ib-Id) overlying a buried asphalt surface (Stratum II). The buried asphalt surface, represented by Stratum II in T015, was considered to be a cultural resource and assigned SIHP# 50-80-13-7420 Feature 1 (see Section 7.4.2).

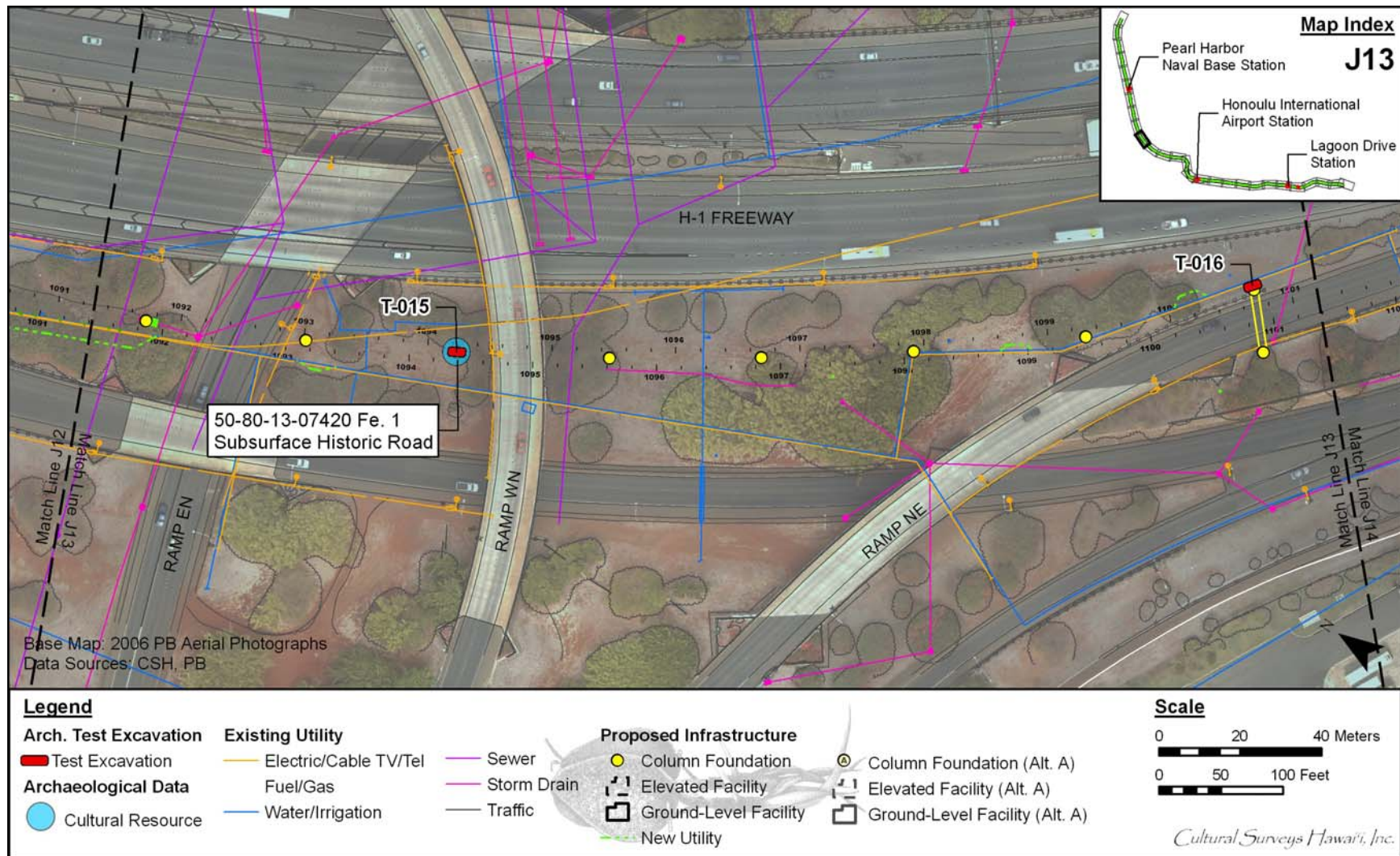


Figure 115. Map Sheet J 13, showing the location of T-015 and T-016 southwest of the H-1 Freeway



Figure 116. Photograph of Airport Section, T-015, general location, view to west



Figure 117. Photograph of Airport Section, T-015, general view of profile, view to northwest

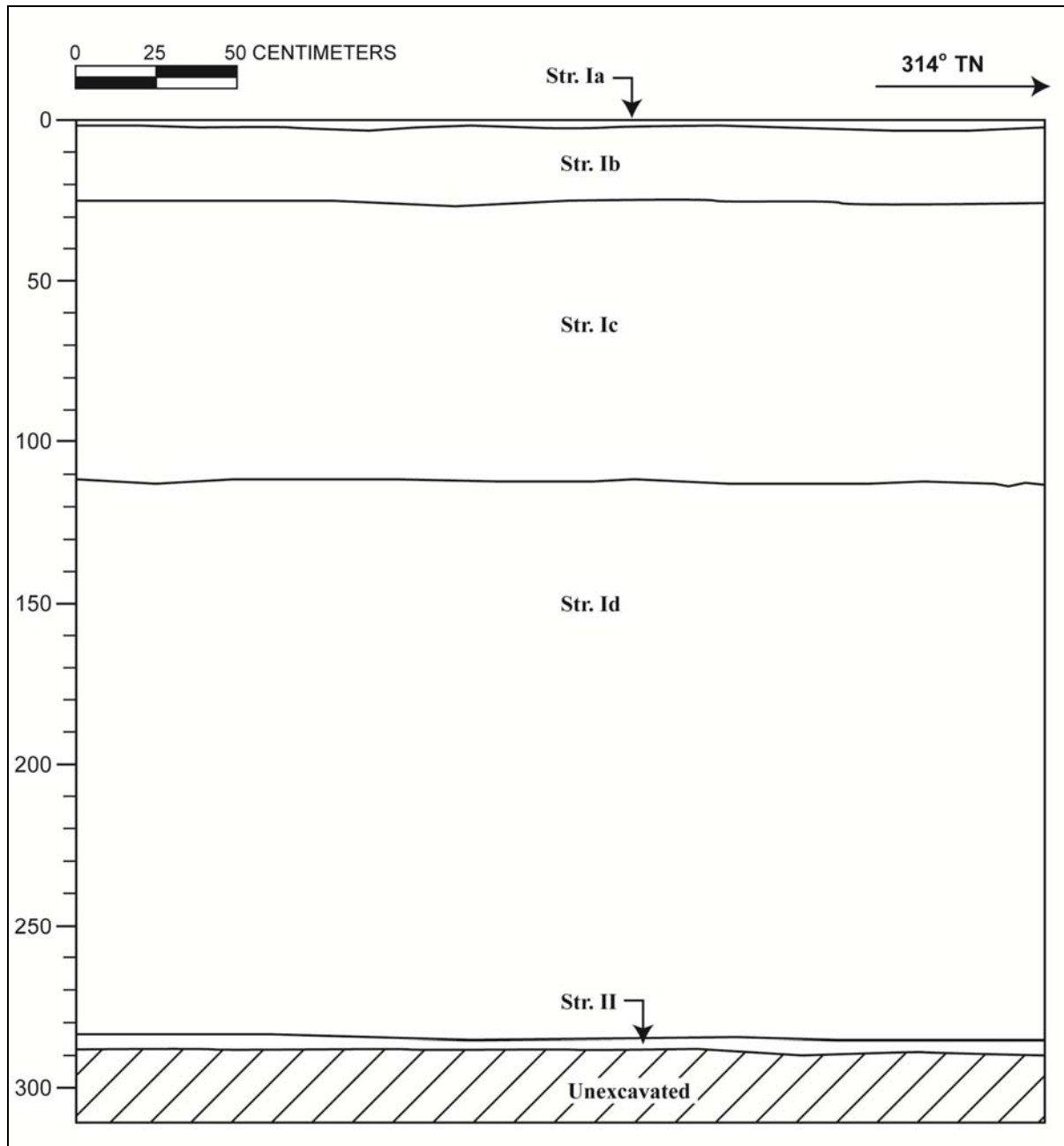


Figure 118. T-015 west profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-2	Fill; sandy silt; 10 YR 2/2 (dark brown); single-grain, fine structure; dry, loose consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; many, very fine to fine roots; topsoil
Ib	2-26	Fill; sandy clay loam; 25 YR 3/6 (dark red); weak, fine, medium, blocky structure; moist, friable consistency; slightly plastic; terrigenous; abrupt, smooth lower boundary; many, very fine to fine to medium to coarse roots
Ic	26-114	Fill; extremely gravelly cobbly sandy silt; 10 YR 4/3 (brown); single-grain, structureless; moist, loose consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; common, very fine to fine roots; gravels grading to cobbles and boulders with depth
Id	114-286	Fill; very cobbly stony sandy silt; 10 YR 3/4 (dark yellowish brown); single-grain, structureless; moist, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; contains angular basalt cobbles and small boulders (~ 50%) with loose sandy silt matrix
II	286-290	Buried asphalt; 10 YR 2/1 (black); massive structure; indurated; terrigenous origin; lower boundary not visible; assigned SIHP# 50-80-13-7420 Feature 1

7.2.16 Test Excavation 16

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-010; 1-1-002
Street:	Between H-1 Freeway (east or <i>mauka</i>) and Makai Frontage Road (west or <i>makai</i>)
Owner:	State DOT
Elevation:	19.5 m
UTM:	610802.672 mE 2360284.081 mN
Max Length/ Width/ Depth	3.04 m/ 1.0 m/ 1.78 m
Orientation:	118/298 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Makalapa clay (MdB)

Setting: Test Excavation 16 (T-016) is in a grassy median between the H-1 Freeway and Ramp that appears to be artificially raised to the level of the freeway (see Figure 115 and Figure 119).

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area was largely underdeveloped scrubby pasture land. By the 1900s the railway allowed development of plantation, largely sugar. T-016 appears to be located within former sugar cane "Field 10" of the Honolulu Plantation (see Figure 17). This portion of the HHCTCP corridor goes through an area expected to have a low probability of cultural resources. Ultimately major development was seen in 1930s-1940s (Figure 19) for military purposes.

Documentation Procedures: The deepest stratum was composed of large to massive boulders. Removing them would undermine the sidewalls and as the overlying fill was loose, would most likely cause collapse. The test excavation was right next to a freeway on ramp and there was concern further excavation might cause instability.

Stratigraphic Summary: The stratigraphy, presented in Figure 120 and Figure 121, consisted of silt loam topsoil (Stratum Ia), extremely gravelly sand fill (Stratum Ib), extremely gravelly silt loam (Stratum Ic), extremely cobbly silt loam (Stratum Id), and extremely boulder silt loam (Stratum Ie). No natural sediment was observed within T-016. The stratigraphy does not conform to the USDA soil designation of Makalapa clay (MdB).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples were collected in the field for laboratory analysis.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and

decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-016 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 100 cmbs (see Appendix E for more details).

Summary: The stratigraphy within T-016 consisted entirely of fill (Stratum Ia-Ie) to the base of excavation. No natural sediments were encountered. The stratigraphy does not conform to the USDA soil designation of Makalapa clay (MdB). No cultural resources were identified.



Figure 119. Photograph of Airport Section, T-016, general location, view to northwest



Figure 120. Photograph of Airport Section, T-016, general view of profile, view to northwest

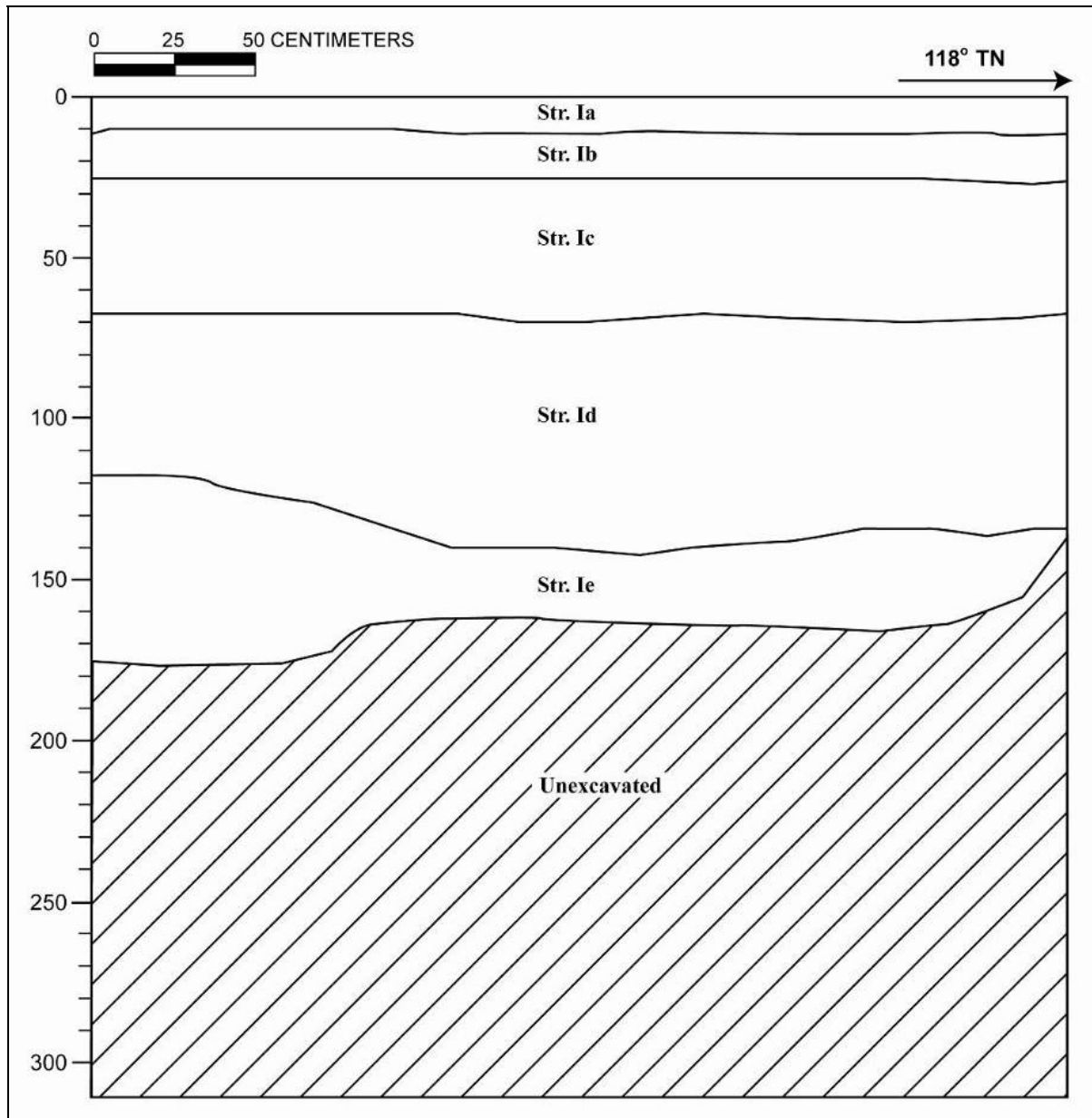


Figure 121. T-016 north profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-10	Fill; silt loam; 10YR 4/6 (dark yellow brown); single-grain, structureless; moist, loose consistency; non-plastic, mixed origin, abrupt, smooth lower boundary, few, fine grass, topsoil
Ib	10-25	Fill; extremely gravelly sand; structureless, single-grain; non-plastic; mixed origin; clear, smooth lower boundary; gravel
Ic	25-70	Fill; extremely gravelly silt loam ; 10 YR 4/3 (brown); structureless, single-grain; dry, loose consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; contains basalt gravel
Id	70-143	Fill; extremely cobbly silt loam; 10 YR 4/3 (brown); structureless, single-grain; dry, loose consistency; non-plastic; mixed origin; clear; smooth lower boundary
Ie	128-178	Fill; extremely bouldery silt loam; 10 YR 4/3 (brown); structureless, single-grain; dry, loose consistency; non-plastic; mixed origin; lower boundary not visible

7.2.17 Test Excavation 17

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002: 004
Street:	Nimitz Highway
Owner:	State DOT
Elevation:	7.3 m
UTM:	611033.7784 mE 2360099.667 mN
Max Length/ Width/ Depth	3.00 m / 1.07 m / 2.85 m
Orientation:	107/287 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Makalapa Clay (MdB)

Setting: Test Excavation 17 (T-017) was located next to the sidewalk along Nimitz Highway, near the intersection of Valkenburgh Street. The surface of T-017 is level with the surrounding ground surface (Figure 122 and Figure 123).

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area was largely underdeveloped pasture land. By the 1900s the railway allowed development of plantation lands in the area. T-017 appears to be located within former sugar cane "Field 10" of the Honolulu Plantation (see Figure 17). This portion of the HHTCTP corridor extends through an area expected to have a low probability of cultural resources. Major development of the area, initiated for military purposes, began in 1930s-1940s (Figure 19).

Documentation Procedures: T-017 was excavated to a depth of 2.85 m.

Stratigraphic Summary: The stratigraphy, presented in Figure 124 and Figure 125, consisted of landscaping topsoil (Stratum Ia), gravelly sandy loam fill (Stratum Ib), gravelly clay loam fill (Stratum Ic), a buried asphalt pavement (Stratum IIa) and associated base course (Stratum IIb), and natural clay loam (Stratum III) overlying volcanic tuff bedrock (Stratum IV). Fill deposits (Stratum Ia-Ic) were 155 cm thick overlying the buried asphalt (Stratum IIa).

The modern fill layers superposing natural material were deposited in local abrupt episodes. Gravelly fill material was superposed over a former asphalt surface, which overlaid a thick layer of crushed coral fill material used as base course. The crushed coral material had a very abrupt lower boundary over natural material with characteristics of Makalapa Clay (MdB), the natural soil for this location, according to USDA soil survey data.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: A bulk sample was collected at the base of Stratum III in order to further characterize the natural sediments and to screen for potential charcoal content. Wet-screened results were negligible.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 25 cmbs.

GPR depth profiles for T-17 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 15 cmbs and again around 80 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 125 cmbs (see Appendix E for more details).

Summary: T-017 documented several layers of fill deposits (Stratum Ia-Ic) overlying a buried asphalt pavement (Stratum IIa) and associated crushed coral base course (Stratum IIb). As indicated by historic background research, the area of T-017 underwent major development in the 1930s to 1950s as a consequence of military activity. Analysis of mid-twentieth century maps (see Section 7.4.2 for discussion of historic properties) indicated that the buried asphalt roadway was likely a minor road development in the late 1940s/1950s related to WWII military build-up. The buried roadway has been designated SIHP # 50-80-13-7420 Feature 2. Beneath SIHP # - 7420 a thick deposit of natural alluvial sediment (Stratum III) overlying a deposit of volcanic tuff bedrock (stratum IV) was encountered. The natural sediment (Stratum II) within T-017 appeared to conform with the USDA soil survey designation of Makalapa Clay (MdB).

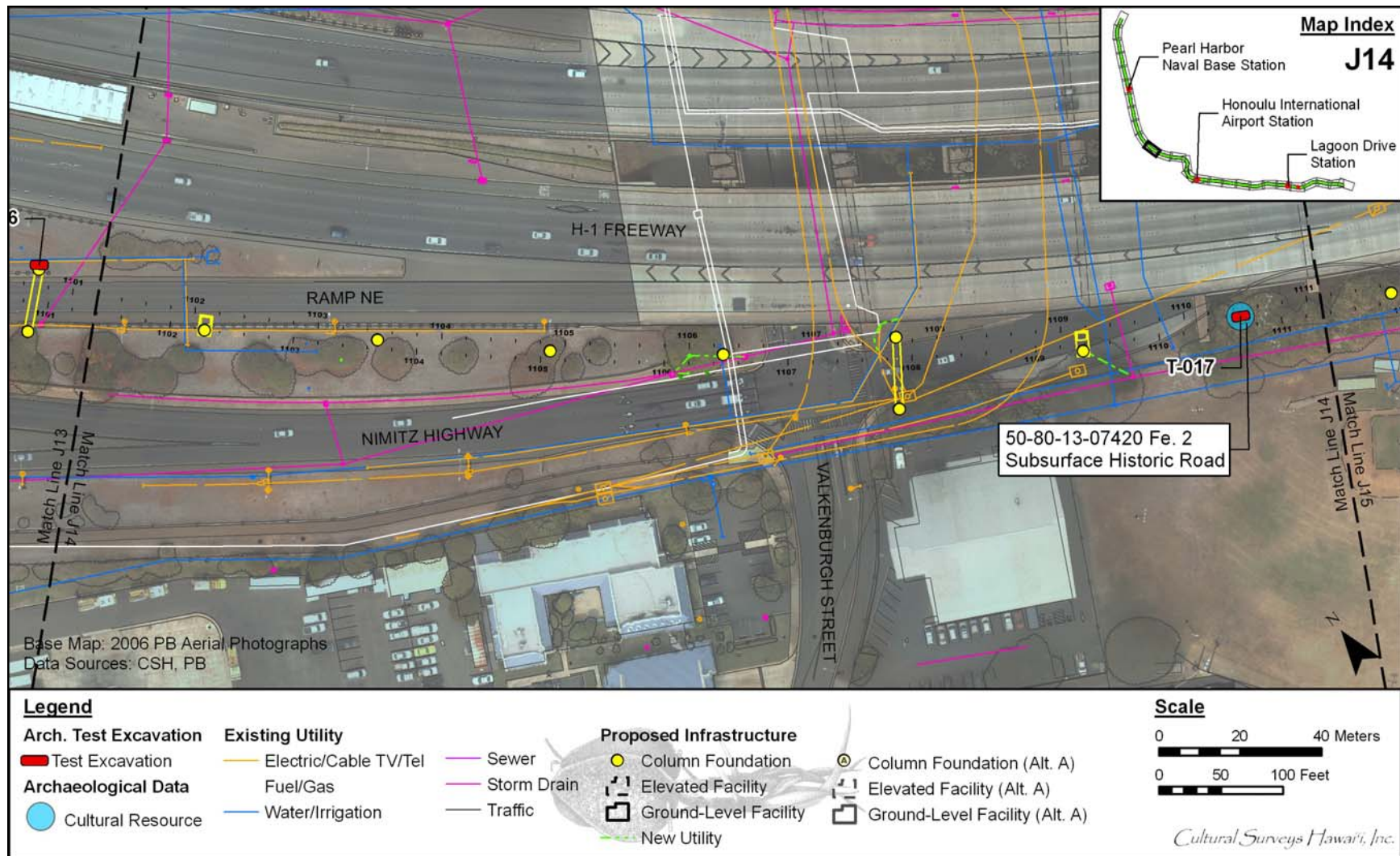


Figure 122. Map Sheet J 14, showing the location of T-017 south of the H-1 Freeway and just east of Valkenburgh Street



Figure 123. Photograph of Airport Section, T-017, general location, view to southeast



Figure 124. Photograph of Airport Section, T-017, general view of profile, view to north

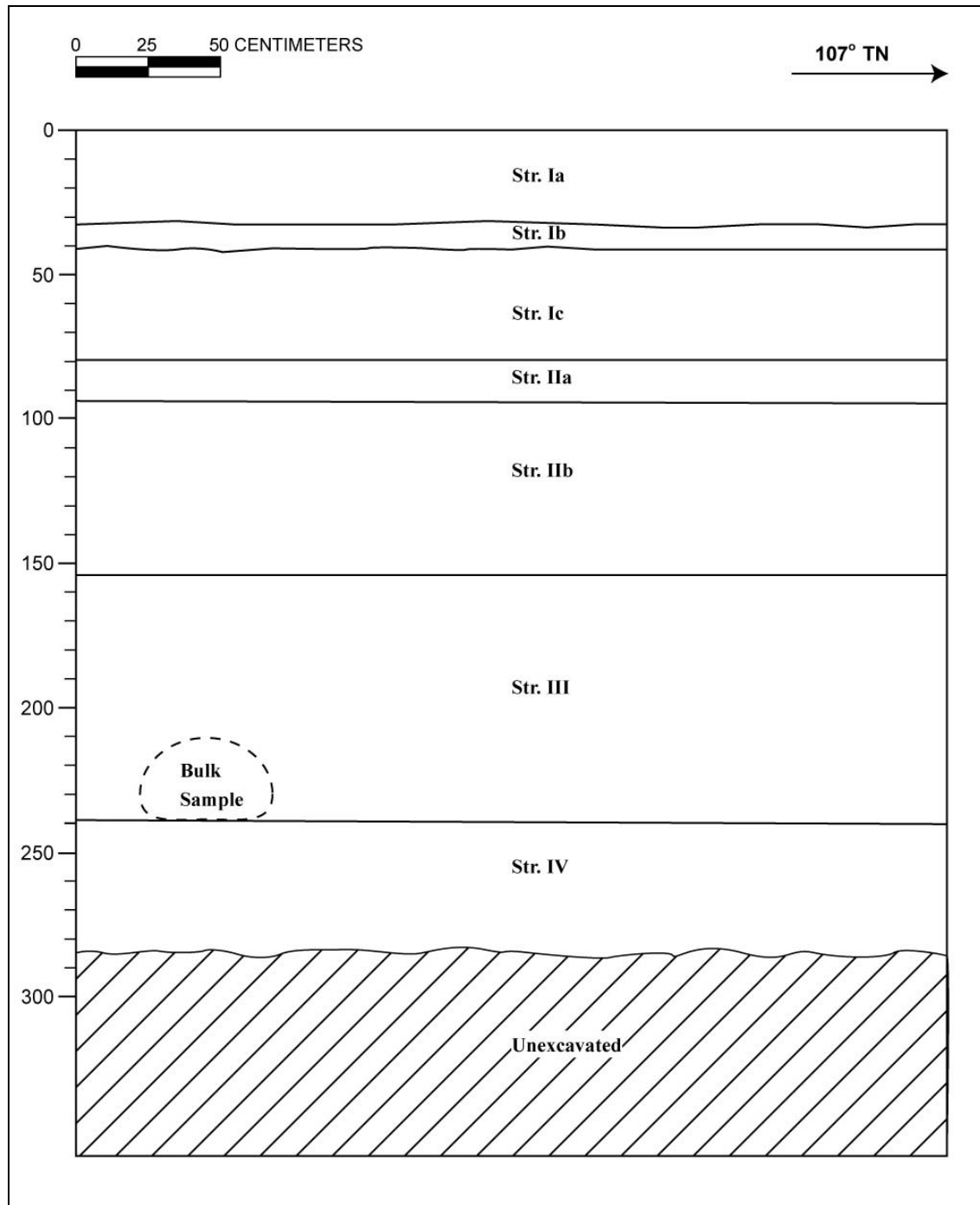


Figure 125. T-017 north profile (above) and stratigraphic description (below)

Airport Section, T-017, Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-33	Fill; silty clay loam; 5 YR 3/3 (dark reddish brown); weak, fine, blocky structure; moist, firm consistency; slightly plastic; terrigenous origin; very abrupt, smooth lower boundary; many, medium to coarse roots; landscaped topsoil
Ib	33-42	Fill; gravelly sandy loam; 10 YR 5/3 (brown) with 50% coarse mottles of 10 YR 8/1 (white); weak, fine, crumb structure; moist, friable consistency; non-plastic; mixed origins; abrupt, smooth lower boundary; coral gravels in sandy loam matrix
Ic	33-80	Fill; gravelly clay loam; 10 YR 4/3 (brown) with 50% coarse mottles of 10 YR 4/1 (dark gray); weak, medium, blocky structure; moist, friable consistency; slightly plastic; very abrupt, smooth lower boundary; basalt and coral gravel in clay loam matrix
Ila	80-95	Asphalt pavement; 10 YR 3/1 (black); massive structure; indurated; non-plastic; terrigenous origin; very abrupt, smooth lower boundary; historic asphalt pavement possibly associated with military development in the 40s and 50s, SIHP # -7420
Ilb	95-155	Fill; sandy loam; 10 YR 6/3 (pale brown) with 50% fine to very coarse mottles of 10 YR 8/1 (white); weak, fine, crumb structure; moist friable consistency; non-plastic; mixed origin; smooth lower boundary; coral gravels and cobbles in sandy loam matrix; base course for overlying asphalt pavement
III	155-240	Natural; clay loam; 2.5 YR 4/3 (olive brown); moderate, medium, blocky structure; moist, friable consistency; slightly plastic; terrigenous origin; diffuse, smooth lower boundary; few, medium roots; natural colluvial sediment: Makalapa Clay (MdB)
IV	240-285	Natural; tuff; 10 YR 3/2 (very dark gray brown) with 25% fine mottles of 10 YR 8/1 (white); strong, medium-coarse, platy structure; dry, hard consistency; non-plastic; terrigenous origin; lower boundary not visible; volcanic tuff bedrock

7.2.18 Test Excavation 18

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002: 004
Street:	Nimitz Highway
Owner:	State DOT
Elevation:	6.32 m
UTM:	611221.5905 mE 2360024.716 mN
Max Length/ Width/ Depth	3.5 m / 1.04 m / 2.85 m
Orientation:	285/105 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Makalapa Clay (MdB)

Setting: Test Excavation 18 (T-018) was located near Nimitz Highway, between Main Street and Elliott Street (see Figure 126 and Figure 127). The topography is level.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area was largely underdeveloped pasture land. By the 1900s the railway allowed development of plantation lands in the area. T-018 appears to be located within former sugar cane “Field 10” of the Honolulu Plantation (see Figure 17). The 1943 War Department Aiea quad map (Figure 19) shows the first signs of other development in the area, residential and infrastructural development associated with the military reservation located south (*makai*) of T-018.

Documentation Procedures: T-018 was excavated to a depth of 285 cmbs. Due to the instability of the trench sidewalls, proper trench shoring could not be installed once the base of excavation was reached. Documentation of the lower stratigraphy was therefore obtained via samples collected by the bucket of the excavator.

Stratigraphic Summary: The stratigraphy, presented in Figure 128 and Figure 129, consisted of topsoil fill (Stratum Ia), gravelly sandy loam fill (Stratum Ib), buried asphalt pavement (Stratum IIa), buried concrete curbing (Stratum IIb), and associated coral fill material (Stratum IIc) overlying natural clay (Stratum III) and volcanic tuff bedrock (Stratum IV).

Stratum III appears to conform with the USDA soil designation of Makalapa Clay (MdB).

Artifacts Discussion: A single isolated beer bottle was recovered from Stratum IIc. This Regal Amber Brewing Co. beer bottle was manufactured in San Francisco California in 1942 (see Artifact Analysis Section, 8.1 and Figure 242).

Features Discussion: No features were observed.

Faunal Remains Discussion: An unidentified bivalve fragment (less than 0.1 g) was identified from Stratum III at 240 cmbs. No evidence of cultural activity was observed, hence the presence

of the small amount of marine shell within the sediment is believed to be related to transportation via natural processes.

Other Lab Results: A bulk sediment sample of Stratum III (Makalapa Clay) was collected for potential pollen analysis. Due to the unsafe trench conditions (collapsing sidewall), the bulk sample was collected from the backhoe bucket. A portion of the sample was submitted for pollen analysis (see Section 8.3.2). The portion of the sample that was not submitted for pollen analysis was wet-screened in the lab with no significant finds.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 25 cmbs.

GPR depth profiles for T-018 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 160 cmbs (see Appendix E for more details).

Summary: Stratigraphy within T-018 consisted of fill (Stratum Ia and Ib) overlying a buried roadway (Stratum IIa-IIc), natural Makalapa Clay (Stratum III) and volcanic tuff bedrock (Stratum IV). The buried roadway was comprised of asphalt pavement (IIa) overlying a section of concrete curbing (IIb) and associate thick coral fill (IIc). A Regal Amber Brewing Co. beer bottle (manufacture in 1942) was collected from Stratum IIc. The buried road, including all associated strata (IIa-IIc) have been designated SIHP# 50-80-13-7420 Feature 3 (see Section 7.4.2). Beneath the buried roadway, natural sediment was observed, which appeared to conform with the USDA soil designation of Makalapa Clay (MdB). A bulk sediment sample of Stratum III was collected and a portion of the sample was submitted for Pollen Analysis (see Section 8.3). The remainder of the bulk sample was wet-screened with no significant finds reported. A small unidentified bivalve fragment was identified from Stratum III at 240 cmbs. No evidence of cultural activity was observed, hence the presence of the small amount of marine shell within the sediment is believed to be related to transportation via natural processes.

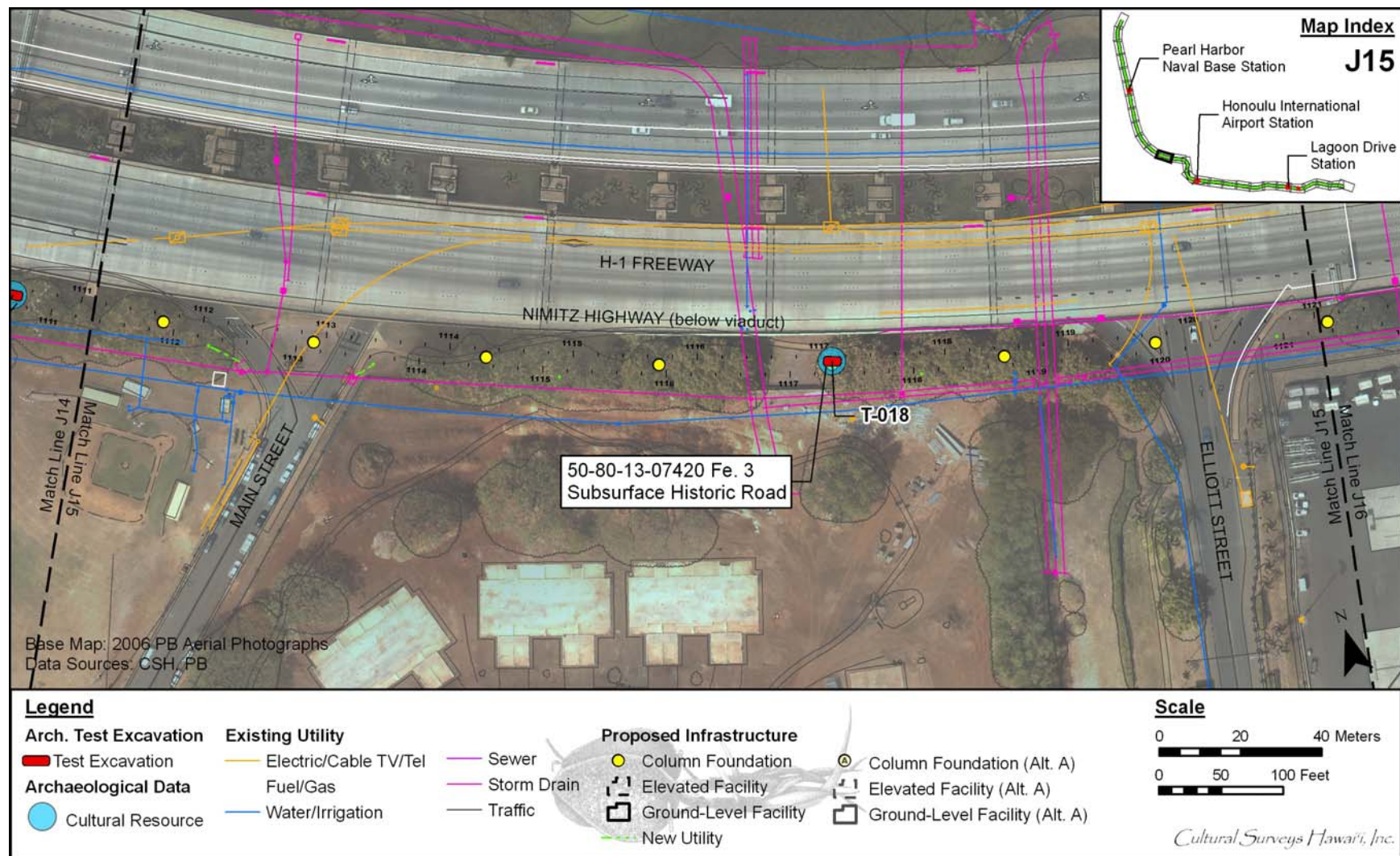


Figure 126. Map Sheet J 15, showing the location of Test Excavation 18 on the south (*makai*) side of the H-1 Freeway, east of Main Street and west of Elliott Street



Figure 127. Photograph of Airport Section, T-018, general location, view to WSW



Figure 128. Photograph of Airport Section, T-018, general view of profile, view to southeast

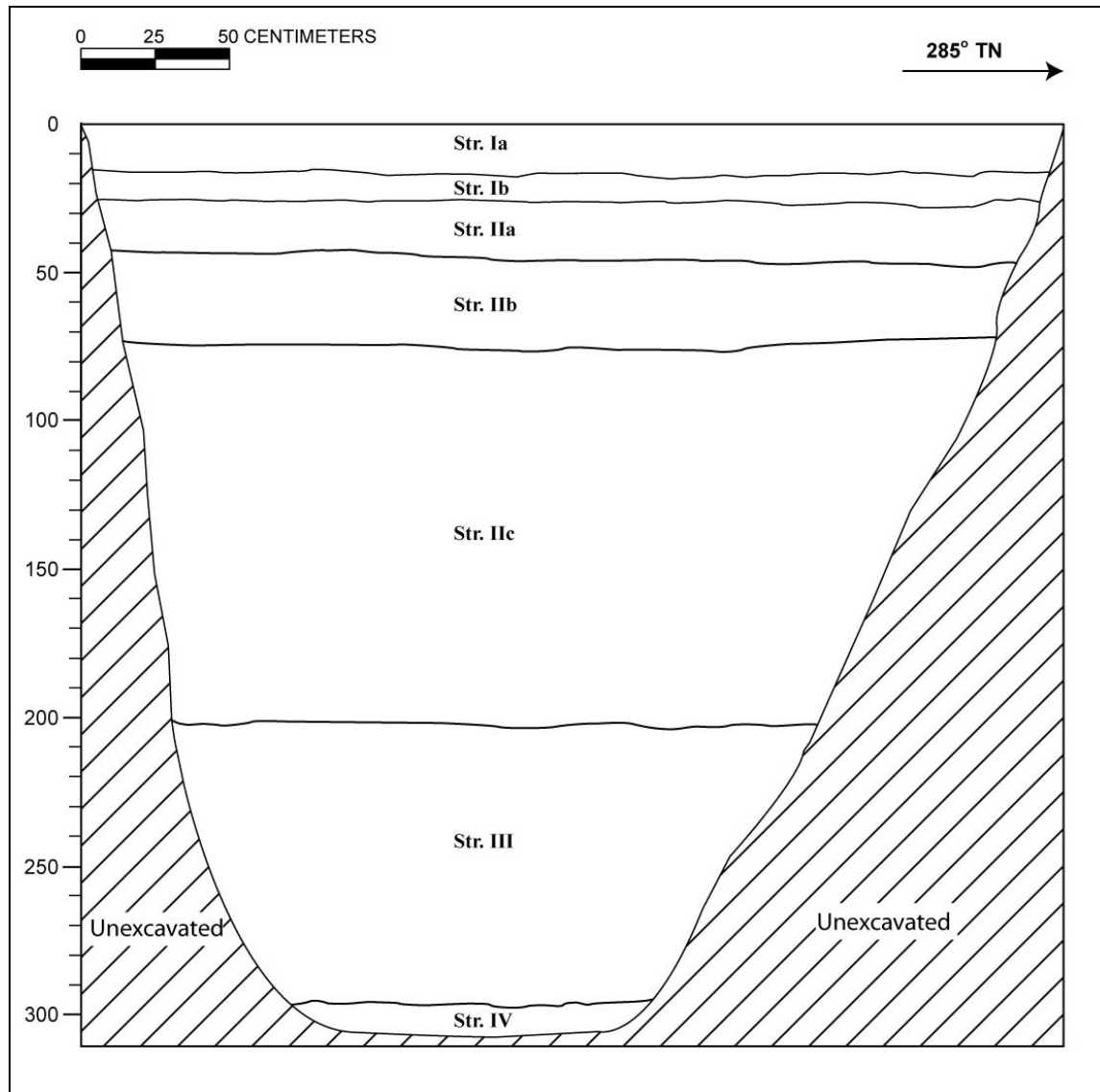


Figure 129. T-018 southwest profile (above) and stratigraphic description (below)

Airport Section, T-018, Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-15	Fill; silty clay loam; 5 YR 3/3 (dark reddish brown); weak, fine, medium, blocky structure; moist, friable consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary; many, fine to coarse roots; contains leaves and other organic material, large root in southeast end; topsoil
Ib	15-25	Fill; gravelly sandy loam; 10 YR 4/3 (brown); weak, medium, coarse, crumb structure; moist, friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; few, fine to medium roots
Ila	25-45	Asphalt Pavement; asphalt; very abrupt, smooth lower boundary; asphalt pavement; assigned as part of SIHP# 50-80-13-7420 Feature 3
Ilb	45-75	Concrete Curbing; concrete; very abrupt, smooth lower boundary; concrete slab rounded at upper edge – likely concrete curbing; assigned as part of SIHP# 50-80-13-7420 Feature 3
Ilc	75-200	Fill; very gravelly sandy loam; 10 YR 6/3 (pale brown); weak, fine, medium, crumb structure; moist, very friable consistency; non-plastic; mixed origin; smooth lower boundary; contains clear glass bottle; coral fill material; assigned as part of SIHP# 50-80-13-7420 Feature 3
III	200-295	Natural; clay; 10 YR 3/2 (very dark grayish brown); weak, medium, coarse, blocky structure; moist, firm consistency; plastic; terrigenous origin; smooth lower boundary; few, very fine to fine roots; contains unidentified bivalve at 240 cmbs; possible Makalapa Clay
IV	295-305	Natural; volcanic tuff; 2.5 YR 3/1 (very dark gray); strong, medium, coarse, platy structure; dry, slightly hard consistency; non-plastic; terrigenous origin; lower boundary not visible; volcanic tuff bedrock

7.2.19 Test Excavation 19

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-003
Street:	Nimitz Highway
Owner:	State DOT
Elevation:	7.44 m
UTM:	611501.1042 mE 2359977.626 mN
Max Length/ Width/ Depth	3.00 m / 1.00 m / 2.90 m
Orientation:	294/114 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Makalapa Clay (MdB)

Setting: Test Excavation 19 (T-019) was located near and parallel to Nimitz Highway, in a grassy area north (*mauka*) of the sidewalk (see Figure 130 and Figure 131). The surface topography is level.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area was largely underdeveloped pasture land. By the 1900s the railway allowed development of plantation lands in the area. T-019 appears to be located within former sugar cane “Field 9” of the Honolulu Plantation (see Figure 17). The 1943 War Department Aiea quad map (Figure 19) shows the first signs of other development in the area, residential and infrastructural development associated with the military reservation located south (*makai*) of T-019.

Documentation Procedures: T-019 was excavated to a depth of 2.9 m. Shoring was installed in order for archaeologists to enter the trench and investigate the lower stratigraphic layers. Due to safety concerns, shoring included large plywood boards to stabilize the trench walls. A cutout area within the plywood board allowed access to the stratigraphy for the purpose of inspection and for taking samples.

Stratigraphic Summary: The stratigraphy, presented in Figure 132 and Figure 133, consisted of topsoil fill (Stratum Ia), extremely gravelly loam (Stratum Ib), crushed coral fill (Stratum Ic), and crushed asphalt fill material (Id) overlying natural clay (Stratum II). Stratum II was a smooth dark brown clay that appears to conform to the USDA soil designation of MdB (Makalapa Clay), although the upper boundary showed slight disturbance by fill events.

Artifacts Discussion: Two railroad spikes and decomposed wood were observed but not collected. These were not “in situ” but would not have been far from the former OR&L railroad alignment.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: A bulk sediment sample of Stratum II (Makalapa Clay) was collected at 230-260 cmbs below surface in order to compare with bulk samples from T-017 and T-018 (Makalapa Clay). Wet-screening results were negligible.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 25 cmbs.

GPR depth profiles for T-019 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs and again around 100 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 125 cmbs (see Appendix E for more details).

Summary: Stratigraphy within T-019 consisted of fill (Stratum Ia-Id) overlying natural clay (Stratum II). Two railroad spikes and decomposed wood (possible railroad tie) were observed within Stratum Id. The central portion of the Airport Section of the HHCTCP corridor extends roughly parallel to the OR&L and may cross that former alignment twice. T-019 appears to be very close to the eastern crossing. It is believed that this portion of the OR&L was constructed just prior to 1899 when it is depicted in a Beasley 1899 map (see Figure 12 and also Figure 14, Figure 16, Figure 17 and Figure 19). While it is not altogether clear, it appears most likely that the spikes relate to the demolition of the OR&L in the late 1940s. The natural sediment (Stratum II) appears to conform to the USDA soil designation of MdB (Makalapa Clay), although the upper boundary showed slight disturbance by fill events. A bulk sediment sample from Stratum II was wet-screened within no significant finds.

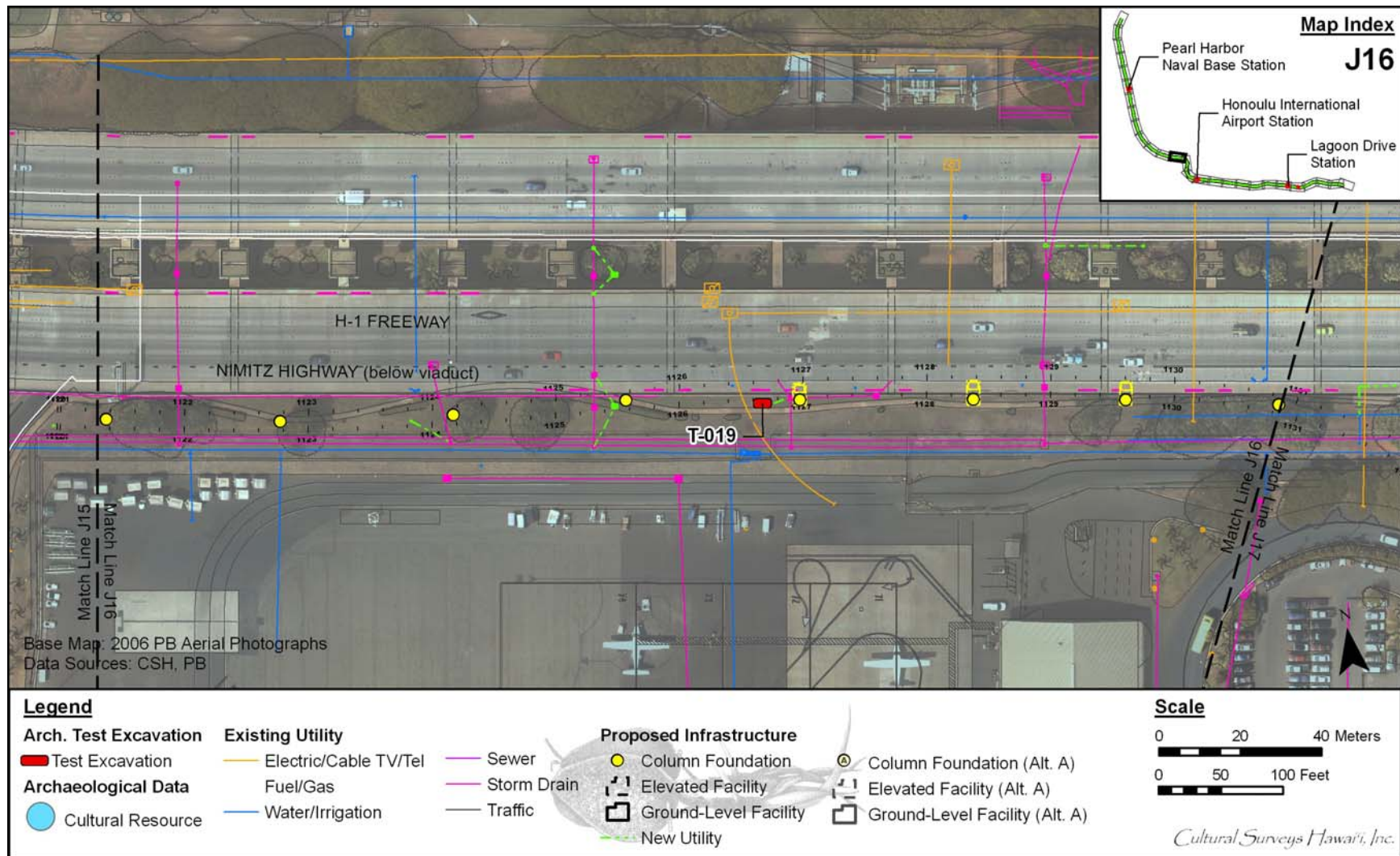


Figure 130. Map Sheet J 16, showing the location of T-019 on the south (*makai*) side of the H-1 Freeway



Figure 131. Photograph of Airport Section, T-019, general location, view to northwest



Figure 132. Photograph of Airport Section, T-019, general view of profile, view to WNW

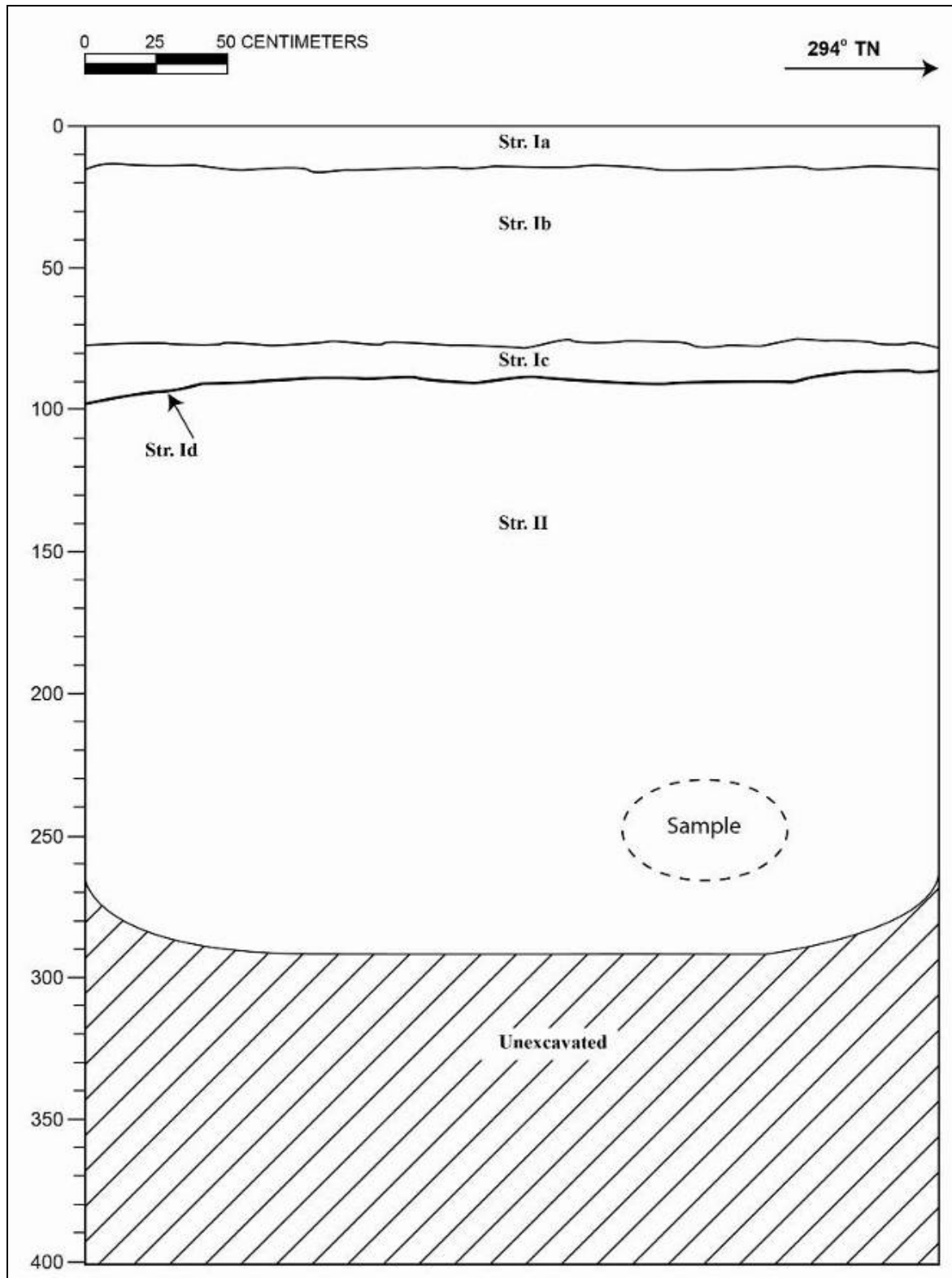


Figure 133. T-019 southwest profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-13	Fill; silty clay loam; 2.5 YR 3/4 (very dark reddish brown); weak, fine, granular structure; moist, friable consistency; slightly plastic; terrigenous origin; smooth lower boundary; common, fine roots; topsoil
Ib	13-76	Fill; extremely gravelly loam; 10 YR 3/1 (very dark gray); weak, fine, crumb structure; moist, loose consistency; non-plastic; mixed origin; few, fine roots; gravel base coarse
Ic	76-98	Fill; sandy loam; 10 YR 7/3 (very pale brown); weak, fine to medium, crumb structure; moist, loose consistency; mixed origin; contains some railroad spikes and decomposed wood; crushed coral fill
Id	98-99	Fill; crushed asphalt; 10 YR 2/1 (black); massive structure; moist, friable consistency; non-plastic; terrigenous origin; clear lower boundary; thin, black layer of asphalt-like material
II	84-290	Natural; clay; 10 YR 3/2 (very dark grayish brown); moderate, blocky structure; moist, firm consistency; plastic; lower boundary not visible; possible Makalapa clay

7.2.20 Test Excavation 20

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002: 001
Street:	Aolele Street
Owner:	U.S. Postal Service
Elevation:	6.1 m
UTM:	611702.7626 mE 2359825.529 mN
Max Length/ Width/ Depth	3.45 m / 1.2 m / 1.9 m
Orientation:	98/278 TN
Targeted Project Component:	Utility line relocation
USDA Soil Designation:	Makalapa Clay (MdB)

Setting: Test Excavation 20 (T-020) was located on a grassy median along Aolele Street between the sidewalk and the chain link fence of the airport Post Office (Figure 134 and Figure 135). The surface of the excavation was slightly higher than street level, but generally level with the surrounding land surface.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area was largely underdeveloped pasture land. By the 1900s the railway allowed development of plantation lands. T-020 appears to be located within former sugar cane "Field 9" of the Honolulu Plantation (see Figure 17). The 1943 War Department Aiea quad map (Figure 19) shows the first signs of other development in the area, residential and infrastructural development associated with the military reservation located south (*makai*) of T-020.

Documentation Procedures: T-020 was excavated to a depth of 190 cmbs. Shoring was installed in order for archaeologists to enter the trench and investigate the lower stratigraphic layers. Due to safety concerns, shoring included large plywood boards to stabilize the trench walls. Due to the hardness of the natural layers and the obstruction of the shoring, samples of the natural strata were taken via backhoe excavator scoop.

Stratigraphic Summary: The stratigraphy, presented in Figure 136 and Figure 137, consisted of silty clay fill (Stratum Ia), sandy clay fill (Stratum Ib), and extremely gravelly loam fill (Stratum Ic) overlying natural silty clay (Stratum II) and volcanic tuff and ash (Stratum IIIa and IIIb).

The fill deposits within T-020 (Stratum Ia-Ic) consisted of terrigenous sediments mixed with marine gravels (coral) and sand, indicating they were imported or at least very disturbed. Stratum II appeared natural, homogenous and undisturbed; however the upper boundary (with Stratum Ib) was very diffuse and the sediments similar. It is possible that Stratum Ib represents an upper/disturbed portion of the same depositional event that created Stratum II. Stratum Ib may have been plowed up and mixed during sugar plantation operations. Strata IIIa and IIIb were naturally deposited and possibly from the same pyroclastic event.

Stratum II appears to conform with the USDA soil survey designation of Makalapa Clay (MdB).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: Bulk samples were collected from the natural strata (Strata II, IIIa, and IIIb) in order to further characterize the natural sediments and to screen for potential charcoal content. Wet-screening results were negligible.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-020 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 100 cmbs (see Appendix E for more details).

Summary: Stratigraphy within T-020 consisted of fill (Stratum Ia-Ic) overlying possible Makalapa Clay (Stratum II) and volcanic tuff and ash deposits (Stratum IIIa and IIIb). Stratum II appears to conform with the USDA soil survey designation of Makalapa Clay (MdB). Bulk samples were collected from the natural strata (Strata II, IIIa, and IIIb) in order to further characterize the natural sediments and to screen for potential charcoal content. Wet-screening results were negligible. No cultural resources were identified.

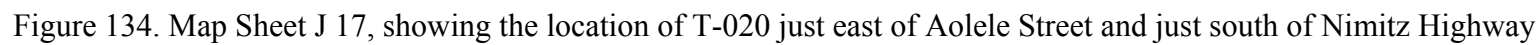




Figure 135. Photograph of Airport Section, T-020, general location, view to southeast



Figure 136. Photograph of Airport Section, T-020, general view of profile, view to west

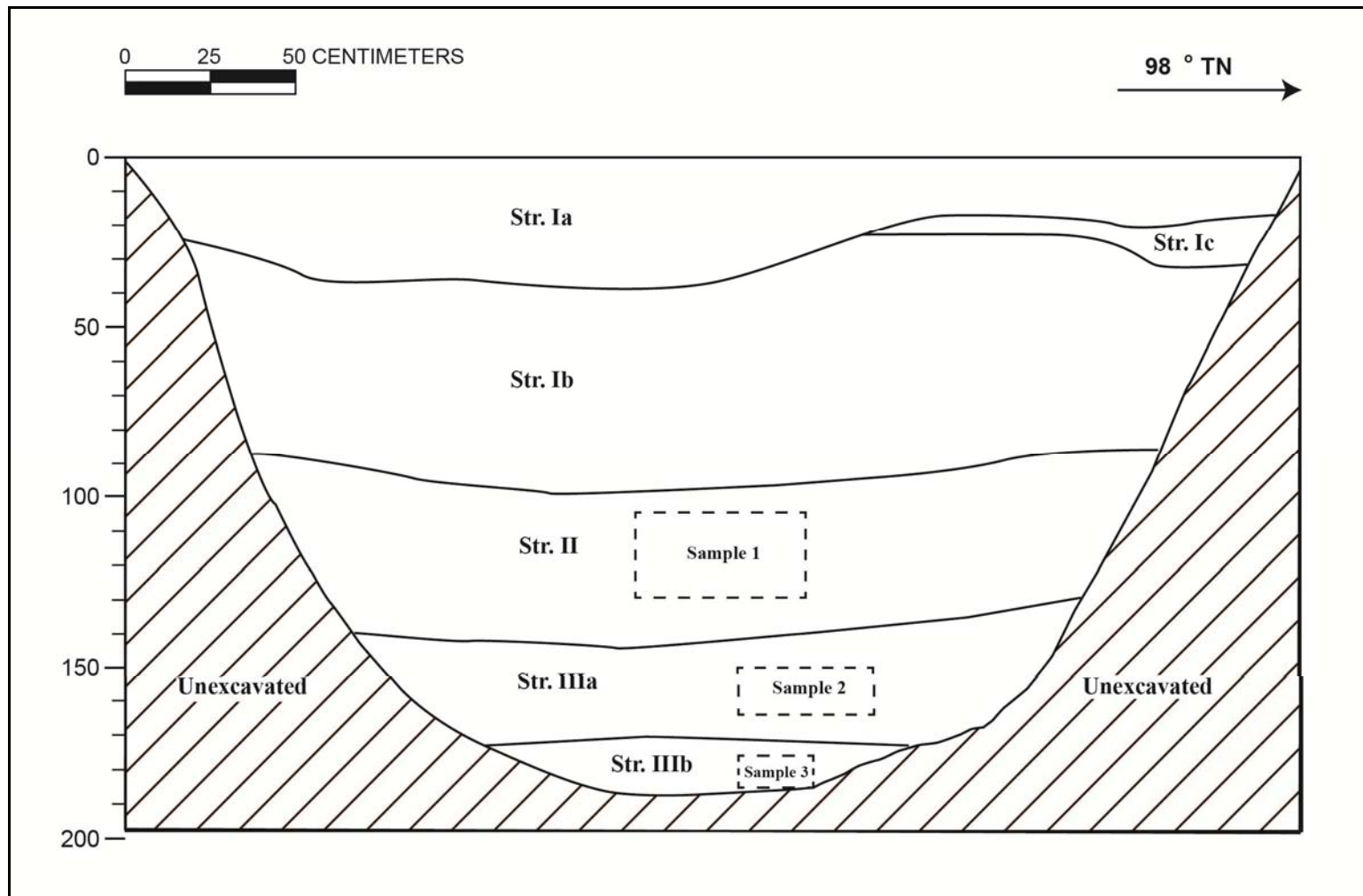


Figure 137. T-020 east profile (above) and stratigraphic description (below)

Stratum	Depth (cmts)	Description
Ia	0-39	Fill; silty clay; 2.5 YR 3/4 (dark reddish brown); weak, fine, granular structure; moist, very friable consistency; plastic; mixed origin; clear, wavy lower boundary; many; medium to coarse roots; contains modern landscaping debris, 5% coral gravels
Ib	20-100	Fill; sandy clay; 10 YR 3/2 (very dark grayish brown); strong, medium to coarse, blocky structure; moist, friable consistency; very plastic; mixed origin; diffuse, smooth lower boundary; many, fine to medium roots; contains (5-10%) coral gravels and small cobbles
Ic	15-30	Fill; extremely gravelly loam; 10 YR 3/2 (very dark grayish brown); weak, medium, crumb structure; moist, friable consistency; plastic; mixed origin; clear, wavy lower boundary; many, fine to coarse roots; contains crushed coral and gravel
II	85-145	Natural; silty clay; 2.5 YR 4/5 (olive brown); moderate, coarse, blocky structure; moist, firm consistency; plastic; abrupt, smooth lower boundary; few, fine roots; contains (1-2%) basalt gravels; Possible Makalapa Clay (MdB)
IIIa	130-175	Natural; volcanic tuff; 10 YR 4/4 (dark yellowish brown); strong, coarse, platy structure; indurated; non-plastic; terrigenous origin; very abrupt, smooth lower boundary; bedrock from the Makalapa eruption(s)
IIIb	175-190	Natural; silty loam/volcanic ash; 10 YR 3/2 (very dark grayish brown); strong, very fine, granular structure; dry, extremely hard consistency; slightly plastic; terrigenous origin; lower boundary not visible; alluvium mixed with volcanic lapilli visible (~40 mm diameter)

7.2.21 Test Excavation 21

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-004: 012
Street:	Ala Onaona Street
Owner:	State DOT Airports Division
Elevation:	5.0 m
UTM:	611782.9396 mE 2359548.335 mN
Max Length/ Width/ Depth	3.7 m / 1.0 m / 2.80 m
Orientation:	187/7 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Keaau Stony Clay (KmaB)

Setting: Test Excavation 21 (T-021) was located in the grassy area in front of the airport *lei* stands, near Ala Onaona Street and Rodgers Boulevard (see Figure 138 and Figure 139). The excavation surface is level with the land surface, though slightly elevated from the adjacent road surface.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area was largely underdeveloped pasture land. By the 1900s the railway allowed development of plantation lands in the area. T-021 appears to be located within former sugar cane “Field 9” of the Honolulu Plantation (see Figure 17). The 1943 War Department Aiea quad map (Figure 19) shows the first signs of other development in the area, residential and infrastructural development associated with the military reservation *makai* of Test Excavation 20.

Documentation Procedures: T-021 was excavated to a depth of 280 cmbs. Shoring was installed in order for archaeologists to enter the trench and investigate the lower stratigraphic layers.

Stratigraphic Summary: The stratigraphy, presented in Figure 140 and Figure 141, consisted of topsoil fill (Stratum Ia), topsoil subgrade (Stratum Ib), compacted coral pavement (Stratum IIa) and coral base course (Stratum IIb) overlying natural clay (Stratum III) and the coral shelf (Stratum IV). The overlying successive fill deposits are understood as associated with airport development. Stratum III appears to conform with the USDA soil survey designation of Keaau Stony Clay (KmaB).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: A trace (<0.1 g) of unidentified bivalvia and miscellaneous marine shell was identified from Stratum III at a depth of 110 to 120 cmbs. No evidence of cultural

activity was observed, hence the presence of the small amount of marine shell within the alluvium is believed to be related to transportation via natural processes.

Other Lab Results: A bulk sample from Stratum III from 110-120 cm below surface was collected in order to further characterize the natural sediments and to screen for potential charcoal content. Wet-screening results were negligible.

GPR Discussion: A review of amplitude slice maps does not clearly indicate any linear features although a utility was encountered during excavation. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-21 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 50 cmbs. No utilities were observed in the GPR profile but a utility was encountered during excavation. The maximum depth of clean signal return was approximately 125 cmbs (see Appendix E for more details).

Summary: Stratigraphy within T-021 consisted of topsoil and subgrade fill (Stratum Ia and Ib) overlying a buried coral road or parking surface (Stratum IIa and IIb) and natural clay (Stratum III) to the coral shelf (Stratum IV). Stratum III appears to conform with the USDA soil survey designation of Keaau Stony Clay (KmaB). A 1943 map (Figure 19) indicates that during an expansive increase in military infrastructure development in 1942/1943, large buildings, understood as warehouses, were constructed in the immediate area of T-021 (with large buildings just to the north, east, and south). A railroad spur line ran south from the OR&L rail line forming a loop surrounding the area of T-021. This rail line suggests that large quantities of heavy material were stored in this immediate area. Thus it seems possible that the buried coral road or parking surface (Stratum IIa and IIb) may be evidence of the prepared, hard, but permeable, surface used to facilitate the mass movement of supplies. The buried coral road or parking surface, represented by Stratum IIa and IIb with T-021, has been designated SIHP# 50-80-13-7421 Feature 3 (see Section 7.4.3).

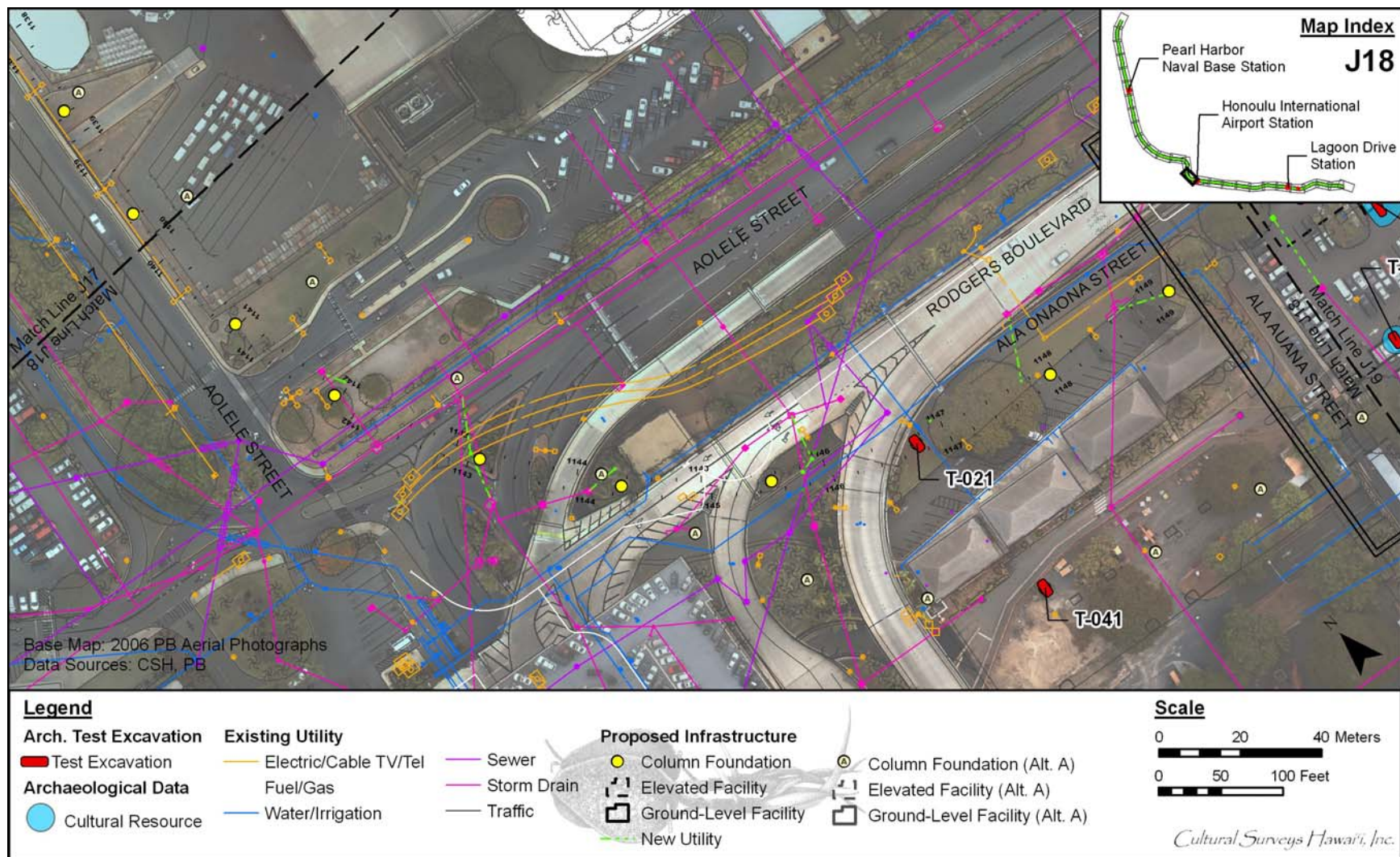


Figure 138. Map Sheet J 18, showing the location of T-021 and T-041 (intervening numbered trenches are just to the east)



Figure 139. Photograph of Airport Section, T-021, general location, view to south



Figure 140. Photograph of Airport Section, T-021, general view of profile, view to southwest

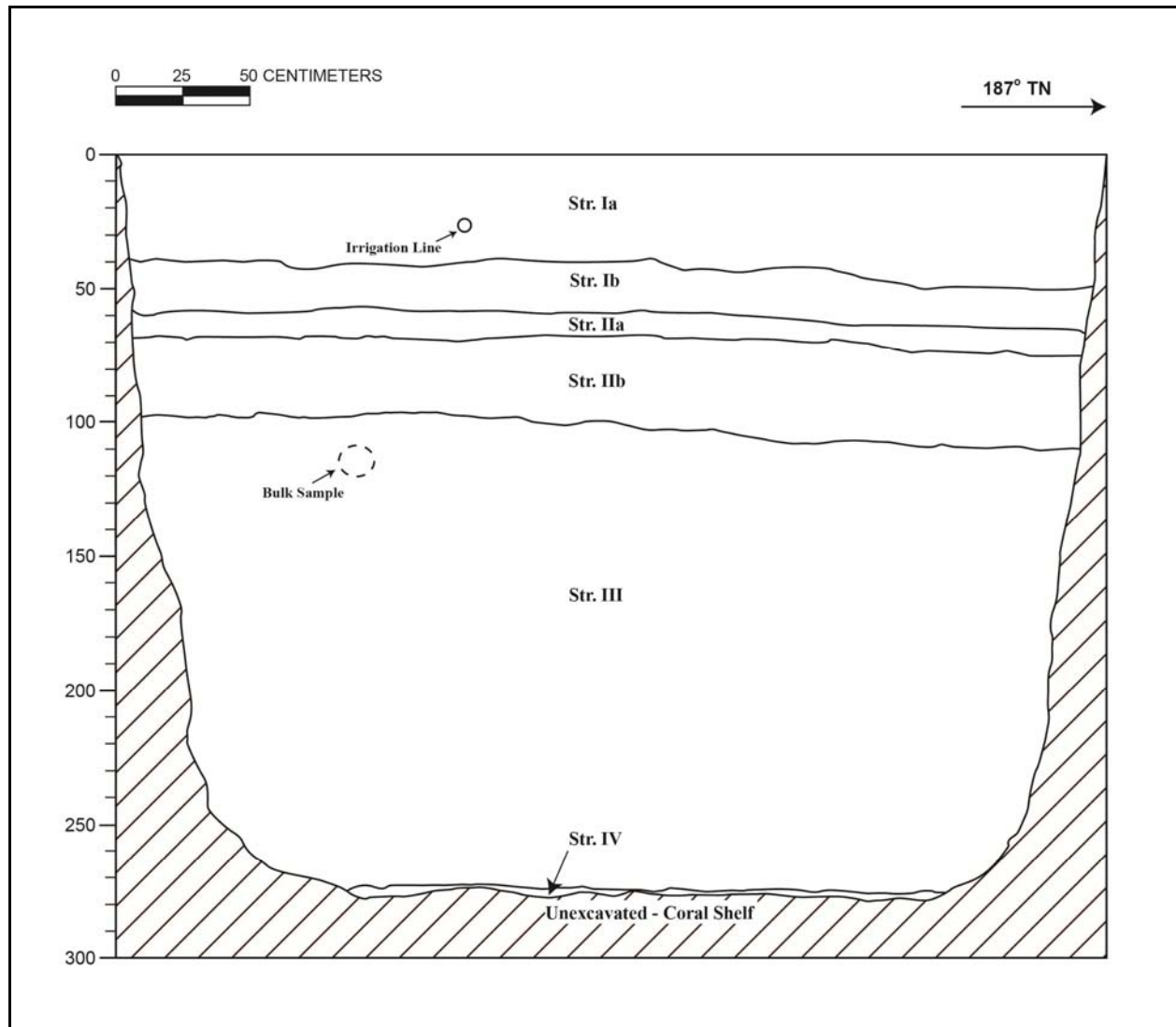


Figure 141. T-021 east profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-50	Fill; silty clay loam; 10 YR 3/6 (dark yellow brown); weak, medium, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; many, fine roots; landscaped topsoil with grass surface
Ib	40-65	Fill; very gravelly silty sand; 10 YR 5/2 (grayish brown); single-grain, structureless; moist, loose consistency; mixed origin; abrupt, smooth lower boundary; few, fine roots; topsoil subgrade
Ila	60-75	Fill; extremely gravelly silty sand; 10 YR 8/2 (very pale brown); single-grain, structureless; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; compacted coral pavement
Ilb	70-110	Fill; extremely gravelly silty sand; 10 YR 6/4 (light yellow brown); single-grain, structureless; moist, loose consistency; non-plastic; mixed origin; very abrupt, smooth lower boundary; coral base course
III	110-225	Natural; clay; 10 YR 4/2 (dark gray brown); moderate, coarse, blocky structure; moist, firm consistency; plastic; terrigenous origin, a trace of unidentified bivalvia and miscellaneous marine shell was identified at a depth of 110 to 120 cmbs; very abrupt, smooth lower boundary
IV	225-230	Natural; limestone; 10 YR 7/2 (very pale brown); massive structure; very hard consistency; marine origin; lower boundary not visible; coral shelf

7.2.22 Test Excavation 22

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002: 001
Street:	Ala Onaona Street
Owner:	State DOT Airports Division
Elevation:	5.2 m
UTM:	611913.3642 mE 2359526.966 mN
Max Length/ Width/ Depth	6.70 m / 0.67 m / 3.04 m
Orientation:	292/212 TN
Targeted Project Component:	Honolulu International Airport Station Entrance Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 22 (T-022) was located in one of the airport parking lots adjacent to the south (*makai*) side of Ala Onaona Street at the intersection of Ala Auana Street (Figure 142, Figure 143, and Figure 144). The surrounding area is relatively level, though the T-022 was located on a slight downward slope leading to a very small dip.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area of T-022 was largely underdeveloped pasture land. By the 1900s the railway and irrigation improvements allowed development, particularly of Honolulu Plantation sugar cane fields. T-022 appears to be located within former sugar cane “Field 9” of the Honolulu Plantation (see Figure 17). There appears to have been a Honolulu Plantation railroad line in this immediate area extending roughly parallel to, and approximately 400 m to the south of, the OR&L line. The 1933 map (Figure 16) shows virtually no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quadrangle map (Figure 19), however, shows expansive residential and infrastructural development in the immediate area associated with military development during the beginning of WWII.

Documentation Procedures: T-022 was excavated to a depth of 304 cmbs. Shoring was installed in order for archaeologists to enter the trench and investigate the lower stratigraphic layers.

Stratigraphic Summary: The stratigraphy, presented in Figure 146 and Figure 147, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib), crushed coral fill (Stratum Ic), and extremely cobbly sandy loam fill (Stratum Id) overlying natural silty clay loam (Stratum II). Cement blocks and block fragments were observed at the upper stratigraphic boundary of Stratum Id. The stratigraphy of T-022 conforms to the USDA soil survey designation of Fill Land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: A bulk sediment sample of Stratum II was taken from the backhoe bucket and another bulk sample was taken from the sidewall and submitted for pollen analysis (see Section 8). The portion of the sample that was not submitted for pollen analysis was wet-screened in the lab with no significant results.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-022 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 100 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-022 consisted of fill (Stratum Ia-Id) overlying natural silty clay loam (Stratum II). Cement blocks and block fragments were observed at the upper stratigraphic boundary of Stratum Id, which may be remnant evidence of the large buildings, understood as warehouses, that were constructed in the vicinity of T-022 during military infrastructure development in 1942 to 1943. The stratigraphy conforms to the USDA soil survey designation of Fill Land (FL). A bulk sediment sample of the natural sediment (Stratum II) was collected from T-022 and a portion of the sediment sample was submitted for pollen analysis (see Section 8).

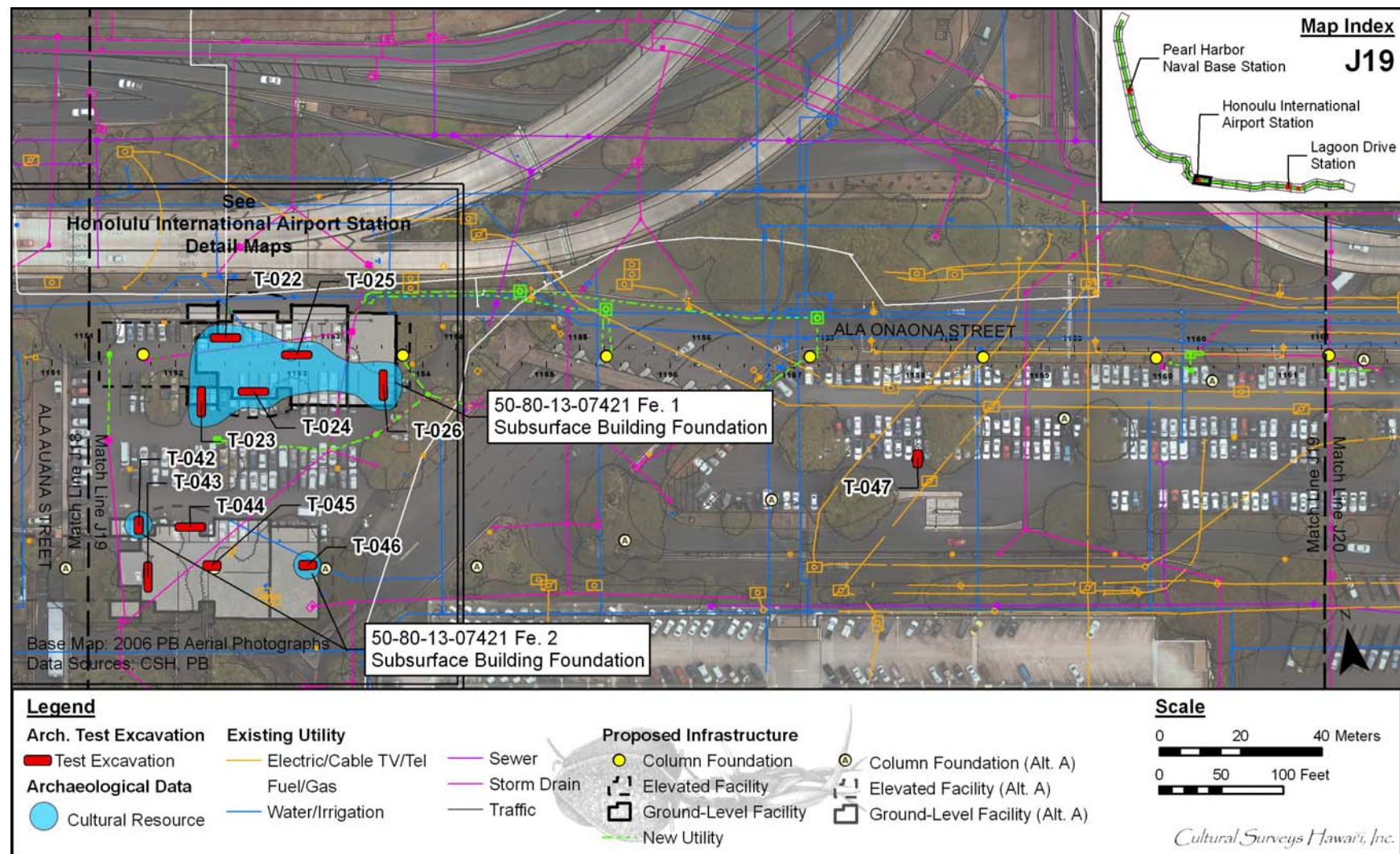


Figure 142. Map Sheet J 19, showing the location of T-0022 to T-0026, T-0042 to Test T-0046, and T-0047 at the proposed Honolulu International Airport Station on the south (*makai*) side of Ala Onaona Street

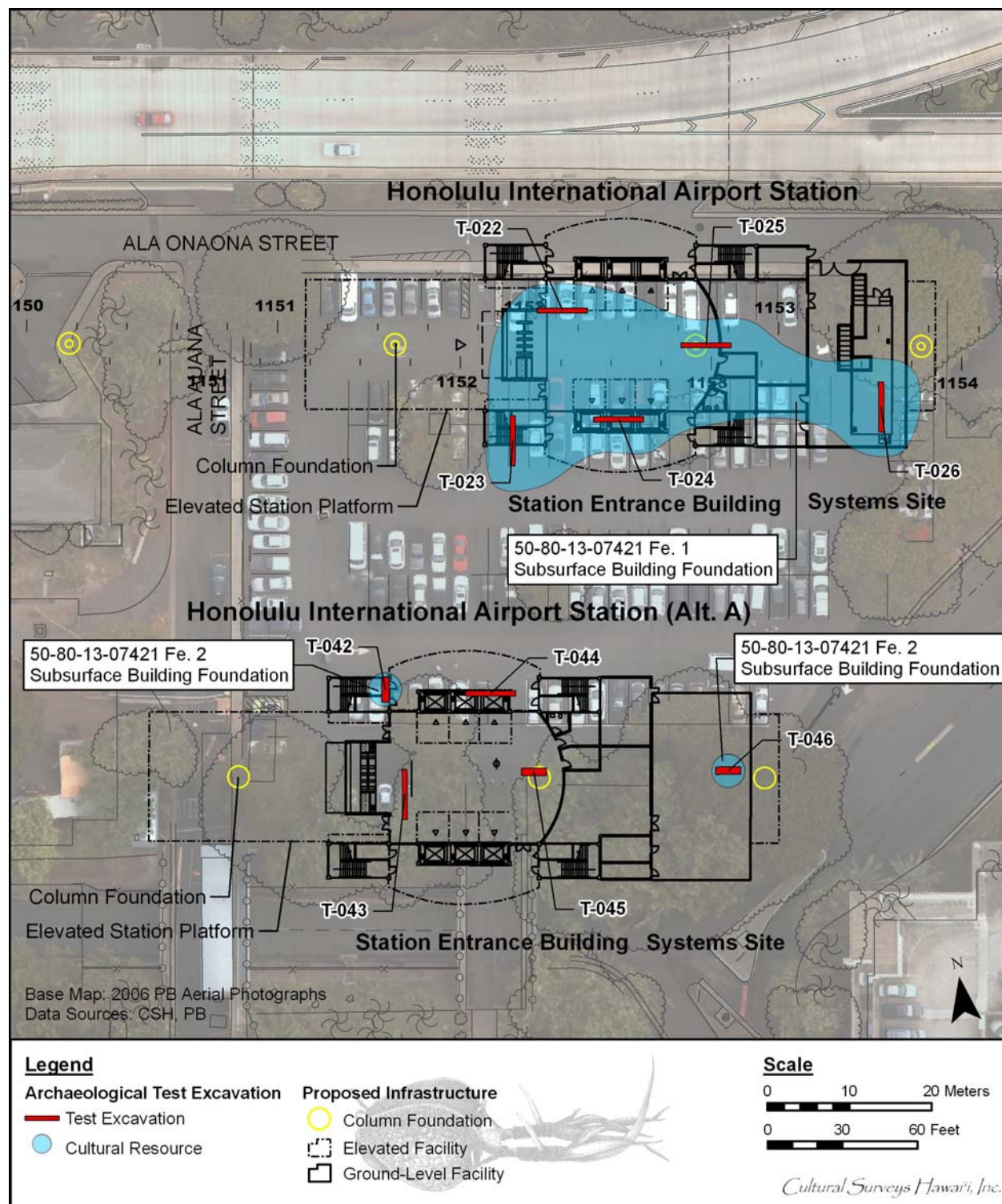


Figure 143. Honolulu International Airport Station overview of Test Excavations

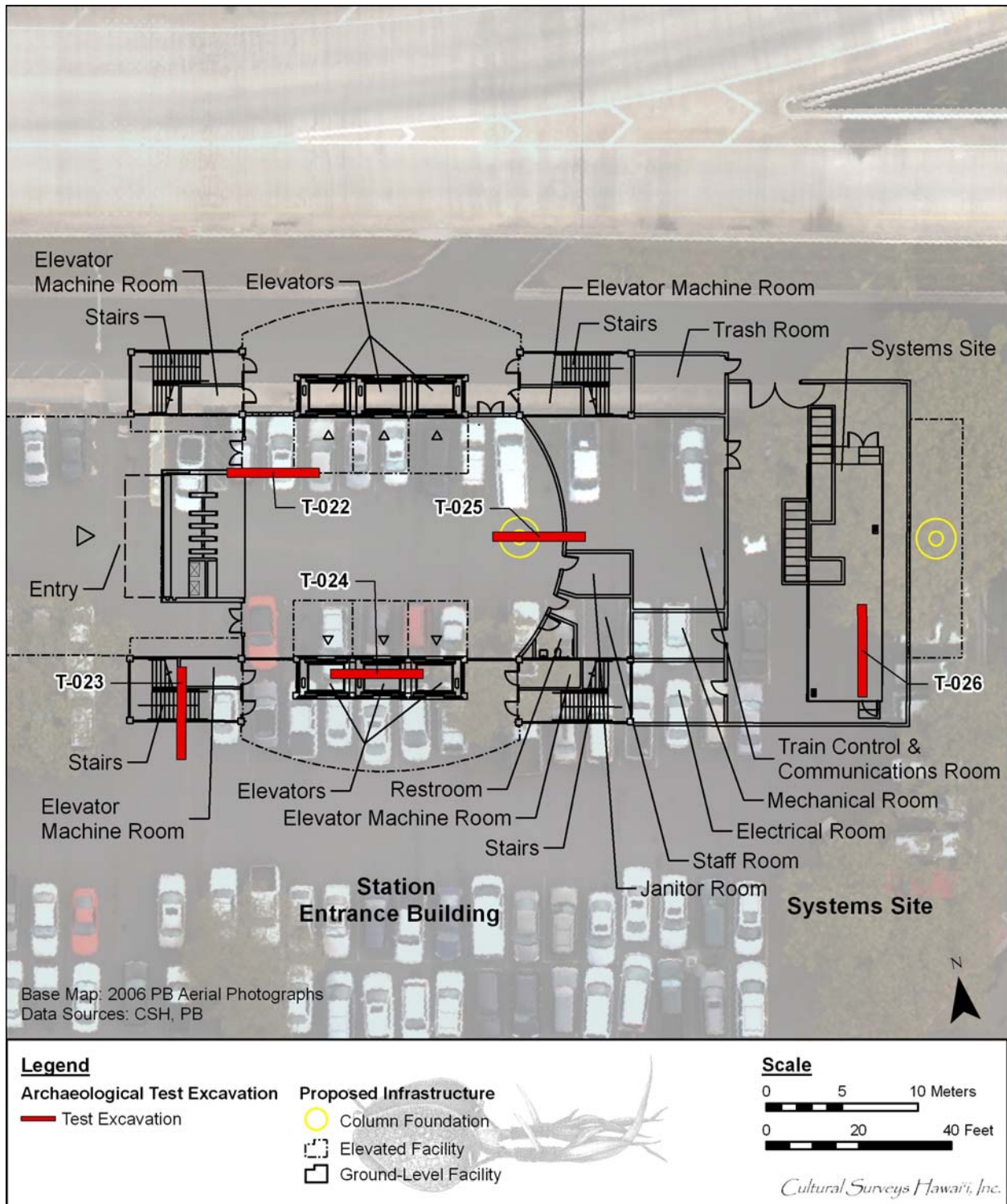


Figure 144. Honolulu International Airport Station overview of Test Excavations at the originally proposed (northern) station footprint showing the location of T-022 to T-026



Figure 145. Photograph of Airport Section, T-022, general location, view to west



Figure 146. Photograph of Airport Section, T-022, general view of profile, view to southwest

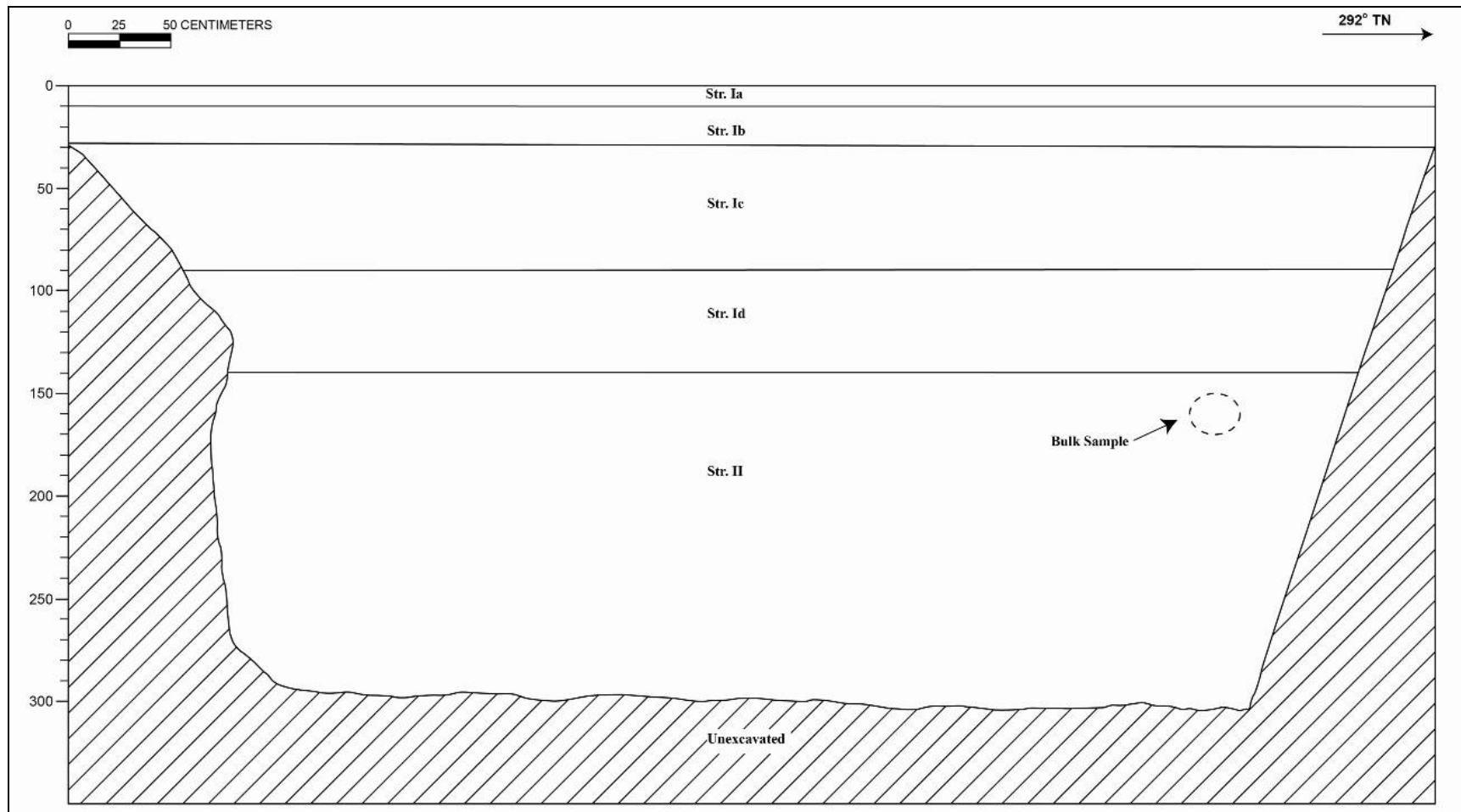


Figure 147. T-022 southwest profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt
Ib	10-29	Fill; gravel base course
Ic	29-90	Fill; very gravelly sand; single-grain, structureless; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; crushed coral fill
Id	90-140	Fill; extremely cobbly sandy loam; 10 YR 3/3 (dark brown); single-grain, structureless; moist, loose consistency; non-plastic; mixed origin; contains cement blocks at upper boundary
II	140-304	Natural; silty clay loam; strong, fine to medium, blocky structure; moist, friable consistency; plastic; mixed origin; lower boundary not visible; natural alluvium with characteristics of Mamala Stony Silty Clay Loam (MnC), however less stony

7.2.23 Test Excavation 23

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002: 001
Street:	Ala Onaona Street (economy parking lot near <i>lei</i> stands)
Owner:	State DOT Airports Division
Elevation:	5.3 m
UTM:	611905.0225 mE 2359512.848 mN
Max Length/ Width/ Depth:	6.75 m / 0.75 m / 1.15 m
Orientation:	10/190 TN
Targeted Project Component:	Honolulu International Airport Station Entrance Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 23 (T-023) was located near the center of the parking lot at the *makai*/Diamond Head corner of Ala Onaona and Ala Auana Streets, parallel to Ala Auana Street (see Figure 142, Figure 143, Figure 144 and Figure 148). The excavation area is level with the surrounding parking lot, with a slight down slope towards Ala Onaona Street.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area of T-023 was largely underdeveloped pasture land. By the 1900s the railway and irrigation improvements allowed development, particularly of Honolulu Plantation sugar cane fields. T-023 appears to be located within former sugar cane "Field 9" of the Honolulu Plantation (see Figure 17). There appears to have been a Honolulu Plantation railroad line in this immediate area extending roughly parallel to, and approximately 400 m to the south of, the OR&L line. The 1933 map (Figure 16) shows virtually no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (Figure 19), however, shows expansive residential and infrastructural development in the immediate area associated with military development during the beginning of WWII.

Documentation Procedures: T-023 was excavated to a depth of 115 cmbs. A concrete jacket and PVC utility lines were uncovered in the central portion of the T-023, limiting excavation. At 115 cmbs a concrete slab was encountered. Excavation through and beneath the concrete slab was determined to be unsafe due to the potential for encased utility lines and sidewall instability.

Stratigraphic Summary: The stratigraphy, presented in Figure 149 and Figure 150, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib), gravelly loam (Stratum Ic), very gravelly cobbly silty sand (Stratum Id), gravelly sand (Stratum Ie), and gravelly silty sand (Stratum If) overlying a buried concrete slab (Stratum II). The stratigraphy of T-023 conforms to the USDA soil survey designation of Fill Land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps indicates a linear feature which corresponds to the utility pipe encountered during excavation. Reflectivity is relatively uniform throughout the grid and decreases with depth except where the utility was encountered. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs and increases again at 75 cmbs.

GPR depth profiles for T-023 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 35 cmbs. A utility is clearly depicted in the GPR profile with a large hyperbola corresponding to the location of the utility. The maximum depth of clean signal return was approximately 150 cmbs (see Appendix E for more details).

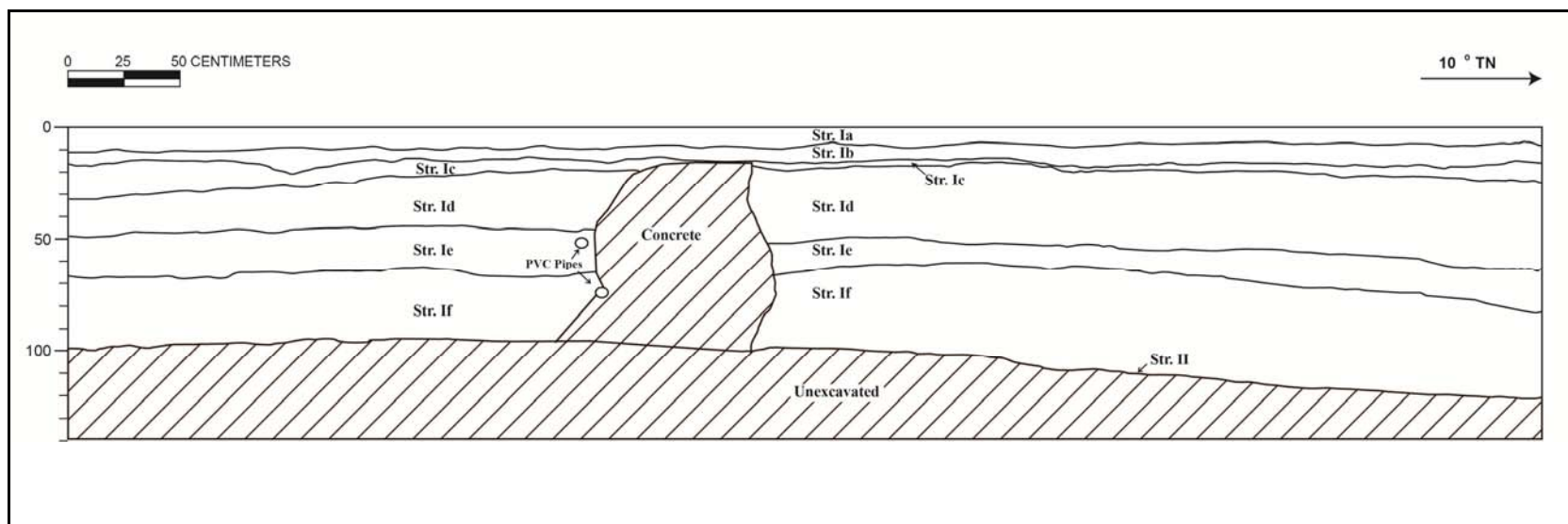
Summary: The stratigraphy of T-023 consisted of fill (Stratum Ia to If) overlying a buried concrete slab (Stratum II) at 115 cmbs. The stratigraphy of T-023 conforms to the USDA soil survey designation of Fill Land (FL). Excavation through and beneath the concrete slab was determined to be unsafe due to the potential for encased utility lines and sidewall instability. A 1943 map (Figure 19) indicates that during an expansive increase in military infrastructure development in 1942/1943, large buildings, understood as warehouses, were constructed in the immediate area of T-023 (with large buildings immediately to the east and west). A railroad spur line extended south from the OR&L rail line forming a loop in the immediate vicinity of T-023. This rail line suggests that large quantities of heavy material were stored in this immediate area. It seems likely that the buried concrete slab (Stratum II) within T-023 was a prepared, hard surface, possibly a receiving apron or dock, to facilitate the mass movement of supplies from the rail line to warehouses. The buried concrete slab, represented by Stratum II in T-023, has been designated as a component of SIHP# 50-80-13-7421 Feature 1 (see Section 7.4.3).



Figure 148. Photograph of Airport Section, T-023, general location, view to south



Figure 149. Photograph of Airport Section, T-023, general view of east profile, view to northeast



Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt
Ib	10-22	Fill; extremely gravelly sandy loam; 7.5 YR 3/1 (very dark gray); weak, medium, crumb structure; moist, friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; gravel base coarse
Ic	20-27	Fill; gravelly loam; 5 YR 3/4 (dark reddish brown); weak, coarse, blocky structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary
Id	20-46	Fill; very gravelly cobbly silty sand; 10 YR 6/4 (light yellowish brown); weak, fine, crumb structure; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary
Ie	45-81	Fill; gravelly sand; 7.5 YR 7/6 (reddish yellow); weak, fine, crumb structure; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary
If	65-115	Fill; very gravelly silty sand; 2.5 YR 7/4 (pale yellow); weak, very fine to fine, crumb structure; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; contains PVC pipe and metal rod
II	115	Concrete; lower boundary not visible; concrete slab

Figure 150. T-023 west profile and stratigraphic description

7.2.24 Test Excavation 24

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002: 001
Street:	Ala Onaona Street
Owner:	State DOT Airports Division
Elevation:	5.4 m
UTM:	611918.1469 mE 2359512.848 mN
Max Length/ Width/ Depth:	6.6 m / 0.72 m / 1.08 m
Orientation:	106/286 TN
Targeted Project Component:	Honolulu International Airport Station Entrance Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 24 (T-024) was located near the center of the parking lot at the *makai*/Diamond Head corner of Ala Onaona and Ala Auana Streets, parallel to Ala Onaona Street (see Figure 142, Figure 143, Figure 144 and Figure 151). The excavation area is level.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area of T-024 was largely underdeveloped pasture land. By the 1900s the railway and irrigation improvements allowed development, particularly of Honolulu Plantation sugar cane fields. T-024 appears to be located within former sugar cane “Field 9” of the Honolulu Plantation (see Figure 17). There appears to have been a Honolulu Plantation railroad line in this immediate area extending roughly parallel to, and approximately 400 m to the south of, the OR&L line. The 1933 map (Figure 16) shows virtually no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (Figure 19), however, shows expansive residential and infrastructural development in the immediate area associated with military development during the beginning of WWII.

Documentation Procedures: T-024 was excavated to a depth of 108 cmbs. At 108 cmbs a concrete slab was encountered. Excavation through and beneath the concrete slab was determined to be unsafe due to the potential for encased utility lines and sidewall instability.

Stratigraphic Summary: The stratigraphy, presented in Figure 152 and Figure 153, consisted of asphalt (Stratum Ia), associated base course (Stratum Ib), and gravelly silty sand fill (Stratum Ic) overlying a buried concrete slab (Stratum II). The stratigraphy of T-023 conforms to the USDA soil survey designation of Fill Land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-024 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 100 cmbs. (see Appendix E for more details).

Summary: The stratigraphy of T-024 consisted of fill (Stratum Ia to Ic) overlying a buried concrete slab (Stratum II) at 108 cmbs. The stratigraphy of T-024 conforms to the USDA soil survey designation of Fill Land (FL). Excavation through and beneath the concrete slab was determined to be unsafe due to the potential for encased utility lines and sidewall instability. A 1943 map (Figure 19) indicates that during an expansive increase in military infrastructure development in 1942/1943, large buildings, understood as warehouses, were constructed in the immediate area of T-023 (with large buildings immediately to the east and west). A railroad spur line extended south from the OR&L rail line forming a loop in the immediate vicinity of T-024. This rail line suggests that large quantities of heavy material were stored in this immediate area. It seems likely that the buried concrete slab (Stratum II) within T-024 was a prepared, hard surface, possibly a receiving apron or dock, to facilitate the mass movement of supplies from the rail line to warehouses. The buried concrete slab, represented by Stratum II in T-024, has been designated as a component of SIHP# 50-80-13-7421 Feature 1 (see Section 7.4.3).



Figure 151. Photograph of Airport Section, T-024, general location, view to northwest



Figure 152. Photograph of Airport Section, T-024, general view of profile, view to WNW

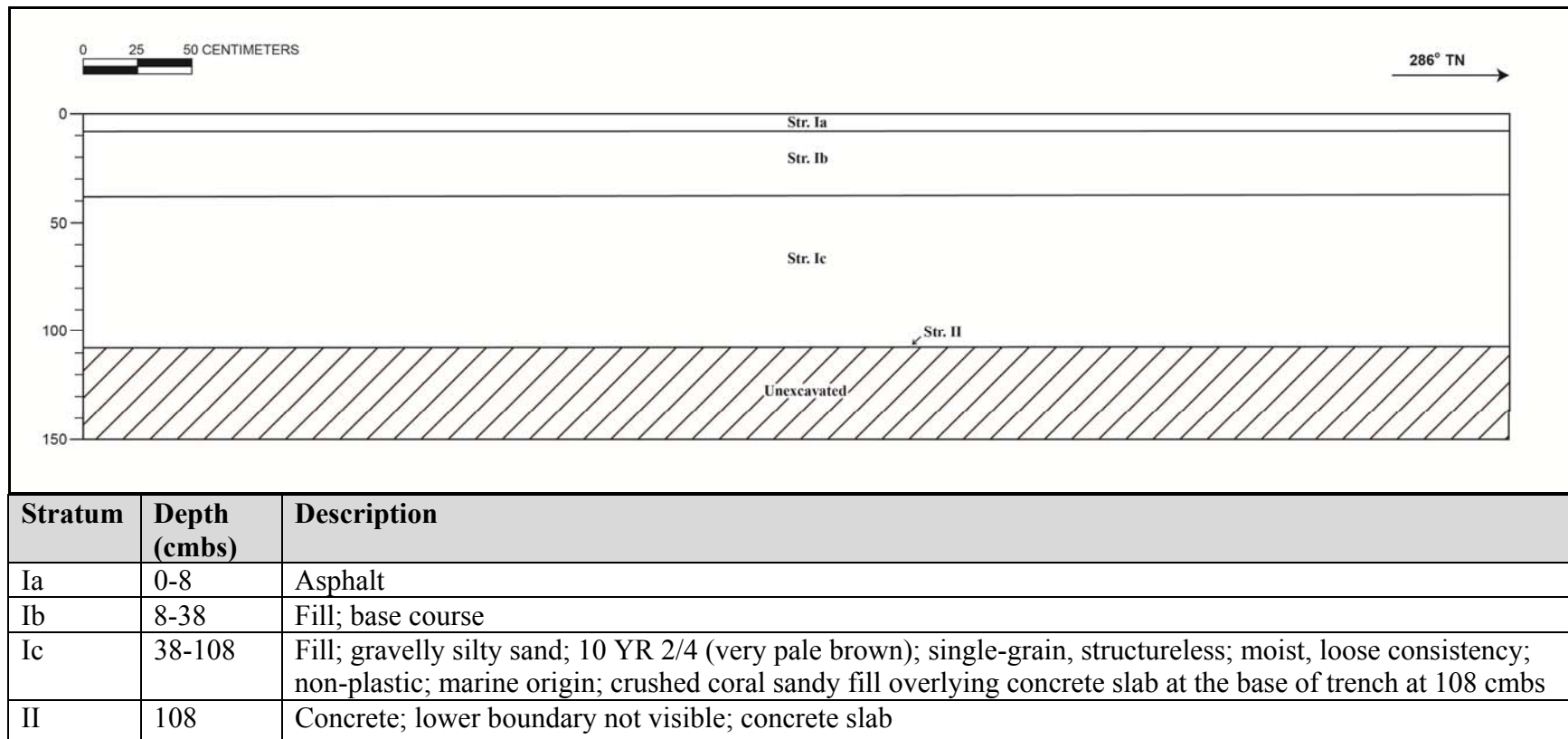


Figure 153. T-024 southwest profile and stratigraphic description

7.2.25 Test Excavation 25

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002: 001
Street:	Ala Onaona Street
Owner:	State DOT Airports Division
Elevation:	5.3 m
UTM:	611930.0379 mE 2359520.163
Max Length / Width / Depth:	6.75 m / 0.74 m / 0.90 m
Orientation:	104/284 TN
Targeted Project Component:	Honolulu International Airport Station Entrance Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 25 (T-025) was located near the edge of the parking lot on the *makai*/Diamond Head corner of Ala Onaona and Ala Auana Streets, parallel with Ala Onaona Street (see Figure 142, Figure 143, Figure 144 and Figure 154). The excavation area is relatively flat in relation to the surrounding surface.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area of Test Excavation 25 was largely underdeveloped pasture land. By the 1900s the railway and irrigation improvements allowed development, particularly of Honolulu Plantation sugar cane fields. Test Excavation 25 appears to be located within former sugar cane "Field 9" of the Honolulu Plantation (see Figure 17). There appears to have been a Honolulu Plantation railroad line in this immediate area extending roughly parallel to, and approximately 400 m to the south of, the OR&L line. The 1933 map (Figure 16) shows virtually no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (Figure 19), however, shows a burst of recent residential and infrastructural development in the immediate area associated with military development during the beginning of WWII.

Documentation Procedures: T-025 was excavated to a depth of 90 cmbs. At 90 cmbs a concrete slab was encountered. Excavation through and beneath the concrete slab was determined to be unsafe due to the potential for encased utility lines and sidewall instability.

Stratigraphic Summary: The stratigraphy, presented in Figure 155 and Figure 156, consisted of asphalt (Stratum Ia), associated base course (Stratum Ib), and crushed coral fill (Stratum Ic) overlying a buried concrete slab (Stratum II). The stratigraphy of T-023 conforms to the USDA soil survey designation of Fill Land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 75 cmbs.

GPR depth profiles for T-025 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 75 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 125 cmbs. (see Appendix E for more details).

Summary: The stratigraphy of T-025 consisted of fill (Stratum Ia to Ic) overlying a buried concrete slab (Stratum II) at 90 cmbs. The stratigraphy of T-025 conforms to the USDA soil survey designation of Fill Land (FL). Excavation through and beneath the concrete slab was determined to be unsafe due to the potential for encased utility lines and sidewall instability. A 1943 map (Figure 19) indicates that during an expansive increase in military infrastructure development in 1942/1943, large buildings, understood as warehouses, were constructed in the immediate area of T-023 (with large buildings immediately to the east and west). A railroad spur line extended south from the OR&L rail line forming a loop in the immediate vicinity of T-025. This rail line suggests that large quantities of heavy material were stored in this immediate area. It seems likely that the buried concrete slab (Stratum II) within T-025 was a prepared, hard surface, possibly a receiving apron or dock, to facilitate the mass movement of supplies from the rail line to warehouses. The buried concrete slab, represented by Stratum II in T-025, has been designated as a component of SIHP# 50-80-13-7421 Feature 1 (see Section 7.4.3).



Figure 154. Photograph of Airport Section, T-025, general location, view to west



Figure 155. Photograph of Airport Section, T-025, general view of profile, view to northeast

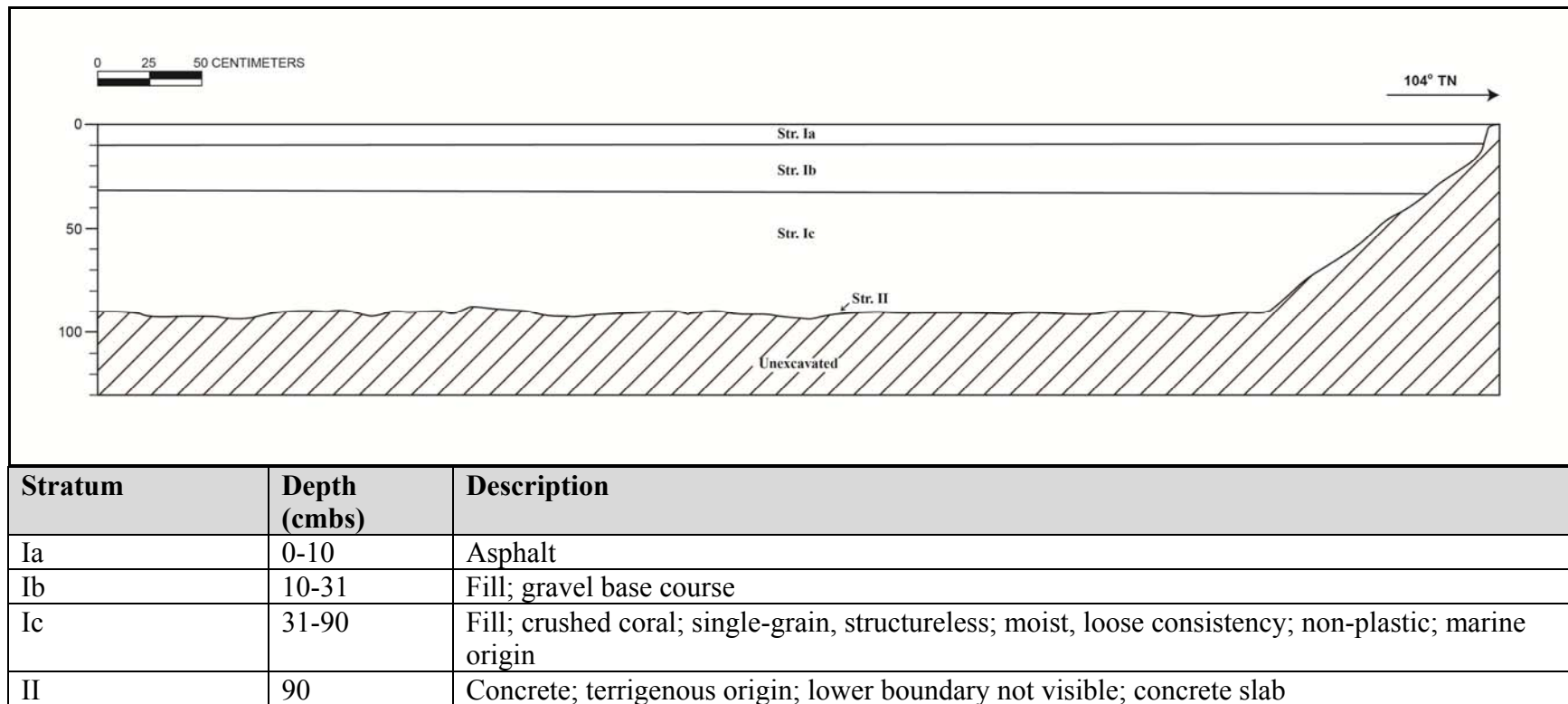


Figure 156. T-025 northeast profile and stratigraphic description

7.2.26 Test Excavation 26

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002: 001
Street:	Ala Onaona Street
Owner:	State DOT Airports Division
Elevation:	5.2 m
UTM:	611949.9499 mE 2359509.558 mN
Max Length/ Width/ Depth:	6.7 m / 0.73 m / 0.82 m
Orientation:	186/6 TN
Targeted Project Component:	Honolulu International Airport Station Entrance Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 26 (T-026) was located near the edge of a parking lot on the *makai*/Diamond Head corner of Ala Onaona and Ala Auana Streets, closest to the airport exit (see Figure 142, Figure 143, Figure 144 and Figure 157). The excavation area is level with the surrounding surface.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area of T-026 was largely underdeveloped pasture land. By the 1900s the railway and irrigation improvements allowed development, particularly of Honolulu Plantation sugar cane fields. T-026 appears to be located within former sugar cane “Field 9” of the Honolulu Plantation (see Figure 17). There appears to have been a Honolulu Plantation railroad line in this immediate area extending roughly parallel to, and approximately 400 m to the south of, the OR&L line. The 1933 map (Figure 16) shows virtually no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (Figure 19), however, shows a burst of recent residential and infrastructural development in the immediate area associated with military development during the beginning of WWII.

Documentation Procedures: T-026 was excavated to a depth of 82 cmbs. At 82 cmbs a concrete slab was encountered. Excavation through and beneath the concrete slab was determined to be unsafe due to the potential for encased utility lines and sidewall instability.

Stratigraphic Summary: The stratigraphy, presented in Figure 158 and Figure 159, consisted of asphalt (Stratum Ia), associated base course (Stratum Ib), extremely gravelly sandy loam fill (Stratum Ic), and crushed coral fill (Stratum Id) overlying a buried concrete slab (Stratum II). The stratigraphy of T-023 conforms to the USDA soil survey designation of Fill Land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-026 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs and again around 75 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 100 cmbs. (see Appendix E for more details).

Summary: The stratigraphy of T-026 consisted of fill (Stratum Ia to Id) overlying a buried concrete slab (Stratum II) at 82 cmbs. The stratigraphy of T-026 conforms to the USDA soil survey designation of Fill Land (FL). Excavation through and beneath the concrete slab was determined to be unsafe due to the potential for encased utility lines and sidewall instability. A 1943 map (Figure 19) indicates that during an expansive increase in military infrastructure development in 1942/1943, large buildings, understood as warehouses, were constructed in the immediate area of T-023 (with large buildings immediately to the east and west). A railroad spur line extended south from the OR&L rail line forming a loop in the immediate vicinity of T-026. This rail line suggests that large quantities of heavy material were stored in this immediate area. It seems likely that the buried concrete slab (Stratum II) within T-026 was a prepared, hard surface, possibly a receiving apron or dock, to facilitate the mass movement of supplies from the rail line to warehouses. The buried concrete slab, represented by Stratum II in T-026, has been designated as a component of SIHP# 50-80-13-7421 Feature 1 (see Section 7.4.3).



Figure 157. Photograph of Airport Section, T-026, general location, general view to south



Figure 158. Photograph of Airport Section, T-026, general view of profile, view to west

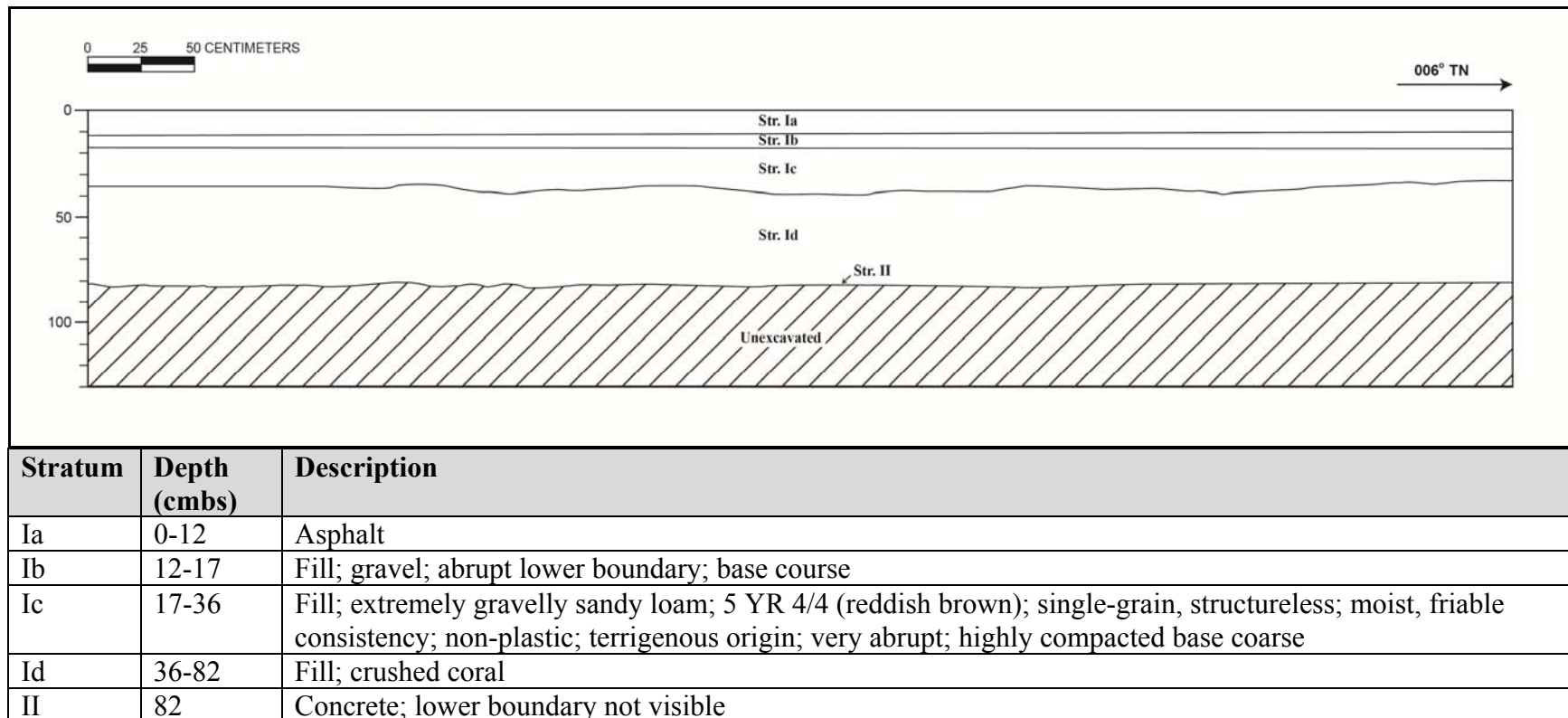


Figure 159. T-026 west profile and stratigraphic description

7.2.27 Test Excavation 27

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-003: 001
Street:	Ala Onaona Street
Owner:	State DOT Airports Division
Elevation:	5.0 m
UTM:	612224.0934 mE 2359475.254 mN
Max Length/ Width/ Depth:	3.7 m / 0.95 m / 2.82 m
Orientation:	98/278 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Fill Land (FL)

Setting: Test Excavation 27 (T-027) was located in the grassy area on the *makai* side of Ala Onaona Street (see Figure 160 and Figure 161). The excavation area is slightly elevated with a tree located to the west.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area of T-027 was largely underdeveloped pasture land. By the 1900s the railway and irrigation improvements allowed development, particularly of Honolulu Plantation sugar cane fields. T-027 appears to be located within former sugar cane “Field 8” of the Honolulu Plantation (see Figure 17). There appears to have been a Honolulu Plantation railroad line in this immediate area extending roughly parallel to, and approximately 400 m to the south of, the OR&L line. The 1933 map (Figure 16) shows virtually no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (Figure 19), however, shows a burst of recent residential and infrastructural development in the immediate area (particularly to the west) associated with military development during the beginning of WWII. This area was developed into a substantial residential subdivision “Damon Tract” in the early 1950s (see Figure 20).

Documentation Procedures: T-027 was excavated to a depth of 282 cmbs. Shoring was installed in order for archaeologists to enter the trench and investigate the lower stratigraphic layers.

Stratigraphic Summary: The stratigraphy, presented in Figure 162 and Figure 163, consisted of topsoil fill (Stratum Ia) and associated base course (Stratum Ib), a buried asphalt layer (Stratum IIa) and associated base course (Stratum IIb), crushed coral fill (Stratum IIc), and very gravelly sand fill (Stratum IId to IIe) overlying natural silty clay loam (Stratum III) to the coral shelf. The stratigraphy generally conforms to the USDA soil survey designation of Fill Land (FL) up to 179 cmbs, where natural alluvial sediment (Stratum III) was encountered.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: A trace (<0.1 g) of *Turbo sandwicensis*, *Hipponix* sp., unidentified bivalvia and miscellaneous marine shell was identified from a wet-screen sample of Stratum III, collected at a depth of 229 to 249 cmbs. No evidence of cultural activity was observed, hence the presence of the small amount of marine shell within the alluvium is believed to be related to transportation via natural processes.

Other Lab Results: A bulk sediment sample was collected at 229-249 cmbs from Stratum III in order to further characterize the natural sediment. The sample contained a trace (<0.1 g) of *Turbo sandwicensis*, *Hipponix* sp., unidentified bivalvia and miscellaneous marine shell.

GPR Discussion: A review of amplitude slice maps may not clearly indicate any linear features although a utility was encountered during excavated. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-027 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 20 cmbs and again around 60 cmbs. No utilities were observed in the GPR profile although a utility was encountered during excavation. The maximum depth of clean signal return was approximately 75 cmbs. (see Appendix E for more details).

Summary: The stratigraphy within T-027 consisted of landscaping fill (Stratum Ia and Ib) overlying fill associated with a buried asphalt pavement (Stratum IIa and IIb), and varying crushed coral fill deposits (Stratum IIc – IIe) overlying natural silty clay loam (Stratum III) to the coral shelf. The stratigraphy generally conforms to the USDA soil survey designation of Fill Land (FL) up to 179 cmbs, where natural alluvial sediment (Stratum III) was encountered. A bulk sample of Stratum III within T-027 was collected in an effort to further characterize the natural sediment. The sample was wet-screened and a trace (<0.1 g) of *Turbo sandwicensis*, *Hipponix* sp., unidentified bivalvia, and miscellaneous marine shell were identified.

T-027 is located east of the main area of 1942/1943 military activity that dominates the stratigraphic record in the excavations to the west. This area contained unpaved roads until the late 1940s/early 1950s with the development of the “Damon Tract” residential area (see Figure 19, Figure 20). The buried asphalt pavement (Stratum IIa) does not correspond to the location of any paved roads on historic maps and likely represents infrastructure less than 50 years of age

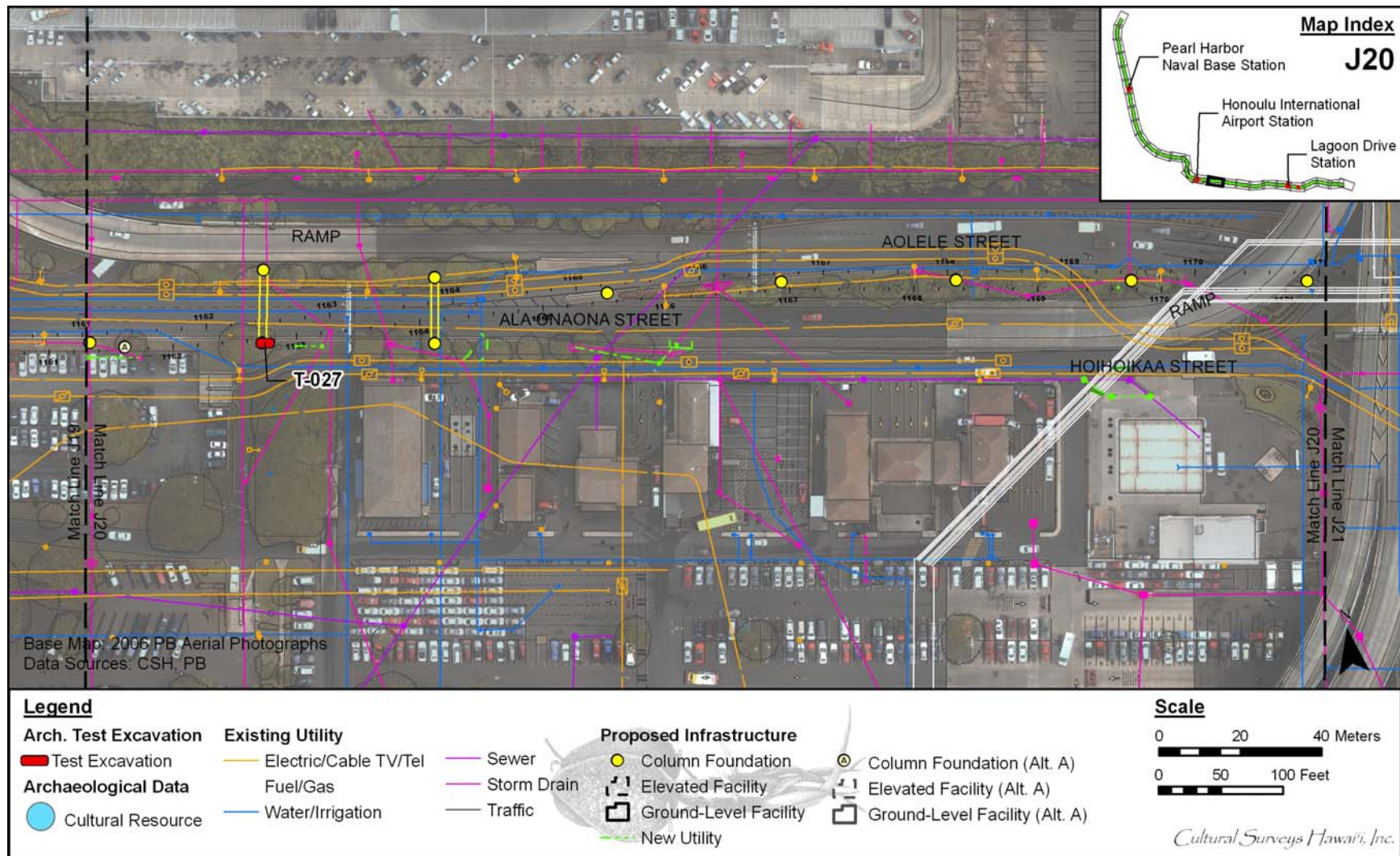


Figure 160. Map Sheet J 20, showing the location of T-027 on Ala Onaona Street



Figure 161. Photograph of Airport Section, T-027, general location, view to west



Figure 162. Photograph of Airport Section, T-027, general view of profile, view to southeast

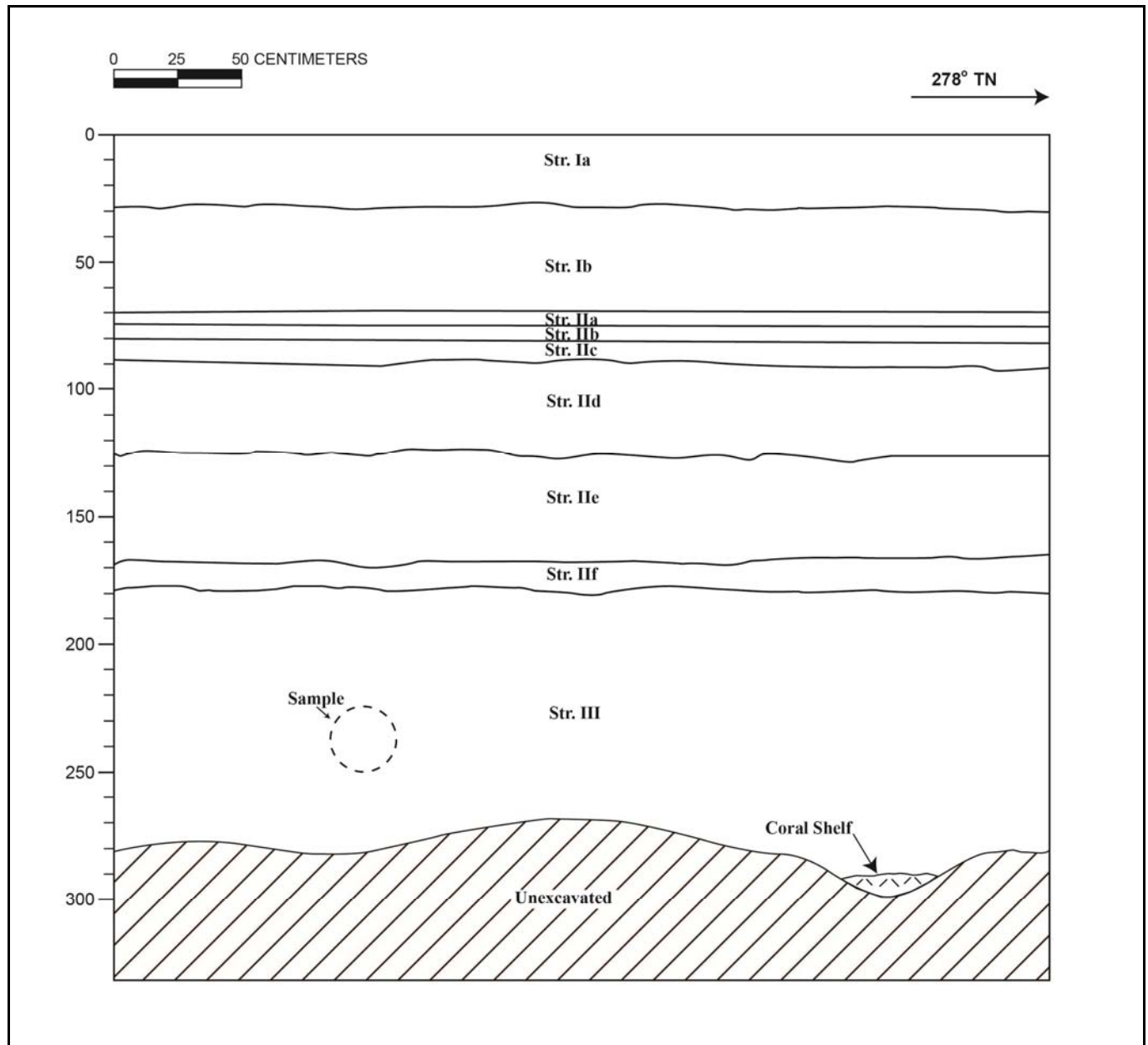


Figure 163. T-027 south profile (above) and stratigraphic description (below)

Airport Section, T-027, Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-25	Fill; very gravelly clay loam; 7.5 YR 3/2 (dark brown); weak, medium, blocky structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; common, fine to medium roots; topsoil
Ib	25-70	Fill; gravelly sandy clay loam; 10 YR 4/4 (dark yellowish brown); weak, fine, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; few, fine roots; gravel base coarse
Ila	70-75	Asphalt; abrupt, smooth lower boundary
Iib	75-80	Fill; very gravelly cobbly loam; 7.5 YR 3/1 (very dark gray); moderate, medium, blocky structure; moist, loose consistency; terrigenous origin; abrupt, smooth lower boundary; gravel base coarse
Iic	80-88	Fill; very gravelly sand; single-grain, structureless; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; crushed coral
Iid	88-125	Fill; very gravelly sand; YR 7/3 (pale yellow); single-grain, structureless; moist, friable consistency; non-plastic; marine origin; abrupt, smooth lower boundary
Iie	125-170	Fill; very gravelly sand; 2.5 YR 8/3 (pale yellow); single-grain, structureless; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; contains marine shell and coral inclusions
Iif	170-179	Fill; very gravelly sand; 10 YR 7/3 (very pale brown); single-grain, structureless; moist, friable consistency; non-plastic; marine origin; abrupt, smooth lower boundary; contains coral
III	179-282	Natural; silty clay loam; 10 YR 4/3 (brown); moderate, fine structure; moist, firm consistency; slightly plastic; terrigenous origin, fragments of <i>Turbo sandwicensis</i> , <i>Hipponix</i> sp., unidentified bivalvia and miscellaneous marine shell was identified at a depth of 229 to 249 cmbs; upper boundary slightly disturbed and intermixed with Stratum Ih; abrupt, smooth lower boundary; overlying coral shelf

7.2.28 Test Excavation 28

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-003: 183
Street:	Aolele Street
Owner:	State DOT Airports Division
Elevation:	5.6 m
UTM:	612756.7395 mE 2359413.536
Max Length/ Width/ Depth:	3.55 m / 0.92 m / 2.05 m
Orientation:	272/92 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Fill Land (FL)

Setting: Test Excavation 28 (T-028) was located north (*mauka*) of Aolele Street and south (*makai*) of the H-1 on-ramp (see Figure 164 and Figure 165). The excavation area is slightly elevated in relation to the surrounding land surface.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area of T-028 was largely underdeveloped pasture land. By the 1900s the railway and irrigation improvements allowed development, particularly of Honolulu Plantation sugar cane fields. T-028 appears to be located within former sugar cane “Field 7” of the Honolulu Plantation (see Figure 17). The 1933 map (Figure 16) shows no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields. The 1943 War Department Aiea quad map (Figure 19), however, shows a expansive residential and infrastructural development in the immediate area (particularly to the west) associated with military development during the beginning of WWII. This area was developed into a substantial residential subdivision “Damon Tract” in the early 1950s (see Figure 20).

Documentation Procedures: T-028 was excavated to a depth of 205 cmbs. An abandoned utility line was encountered at 90 cmbs extending perpendicular through the west end of the excavation. Excavation continued until indurated volcanic tuff was encountered.

Stratigraphic Summary: The stratigraphy, presented in Figure 166 and Figure 167, consisted of gravelly loam fill (Stratum Ia), very gravelly cobbly loam fill (Stratum Ib), very gravelly sandy loam fill (Stratum Ic), gravelly loam fill (Stratum Id) gravelly cobbly loam fill (Stratum Ie), and very gravelly sandy loam fill (Stratum If) overlying natural volcanic tuff bedrock (Stratum II). The stratigraphy conforms to the USDA soil survey designation of Fill Land (FL). All strata were consistent with fill sediment with the exception of volcanic tuff bedrock at the base of excavation (205 cmbs).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps does not clearly indicate any linear features although a utility was encountered during excavation. Reflectivity is relatively uniform throughout the grid and decreases with depth except for the storm drain adjacent to the trench. A transition from higher reflectivity to lower reflectivity is observed at approximately 25 cmbs and increases again around 75 cmbs.

GPR depth profiles for T-028 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile although one was encountered during excavation and a storm drain is present on the East side of the grid. The maximum depth of clean signal return was approximately 150 cmbs. (see Appendix E for more details).

Summary: The stratigraphy of T-028 consisted of a thick deposit of fill composed of multiple strata (Stratum Ia to If) overlying natural volcanic tuff bedrock (Stratum II) at 205 cmbs. No cultural resources were identified.

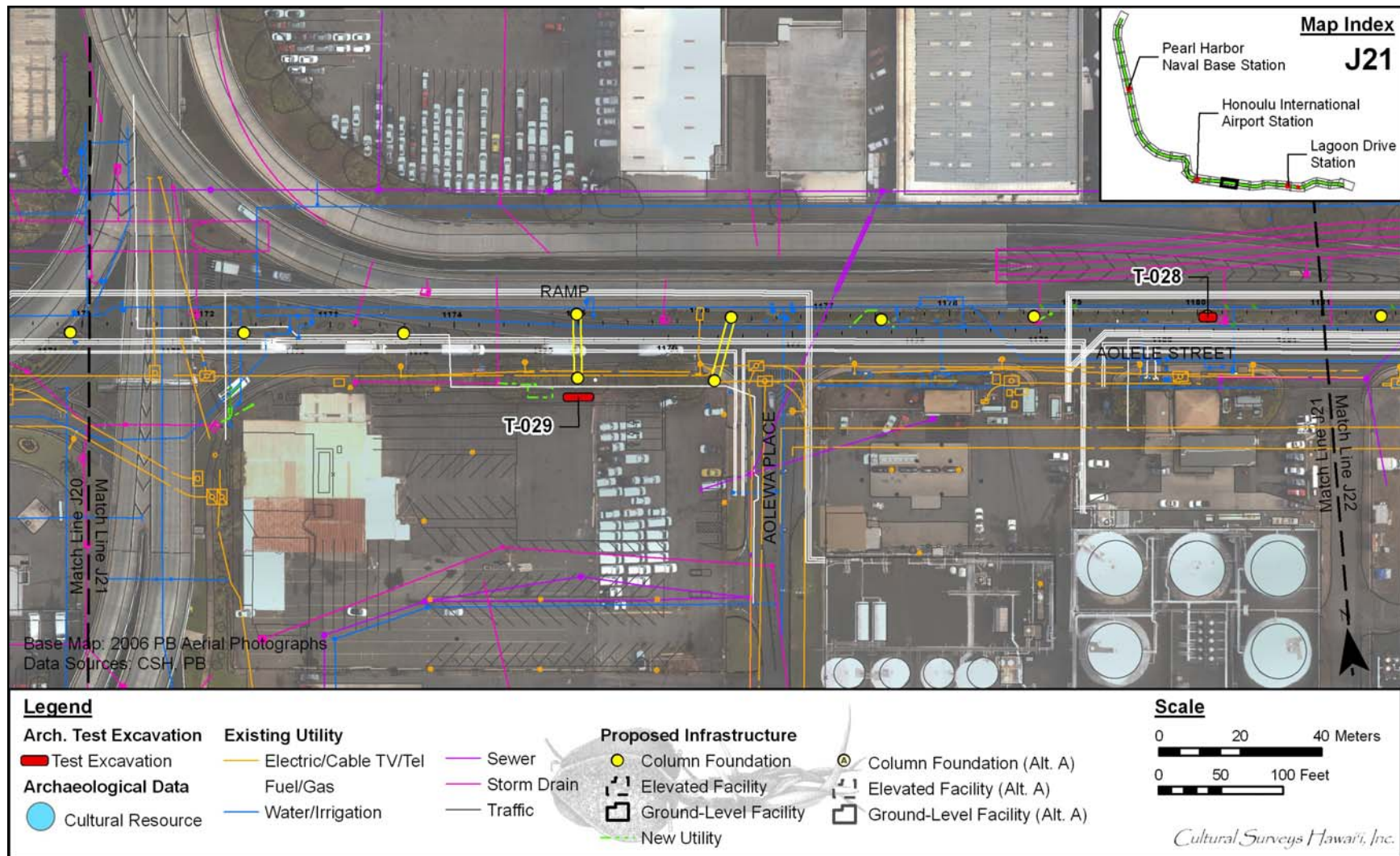


Figure 164. Map Sheet J 21, showing the location of T-028 (just east of Aolele Street/Aolewa Place) and T-029 (just west of Aolele Street/Aolewa Place)



Figure 165. Photograph of Airport Section, T-028, general location, view to southwest



Figure 166. Photograph of Airport Section, T-028, general view of profile, view to southwest

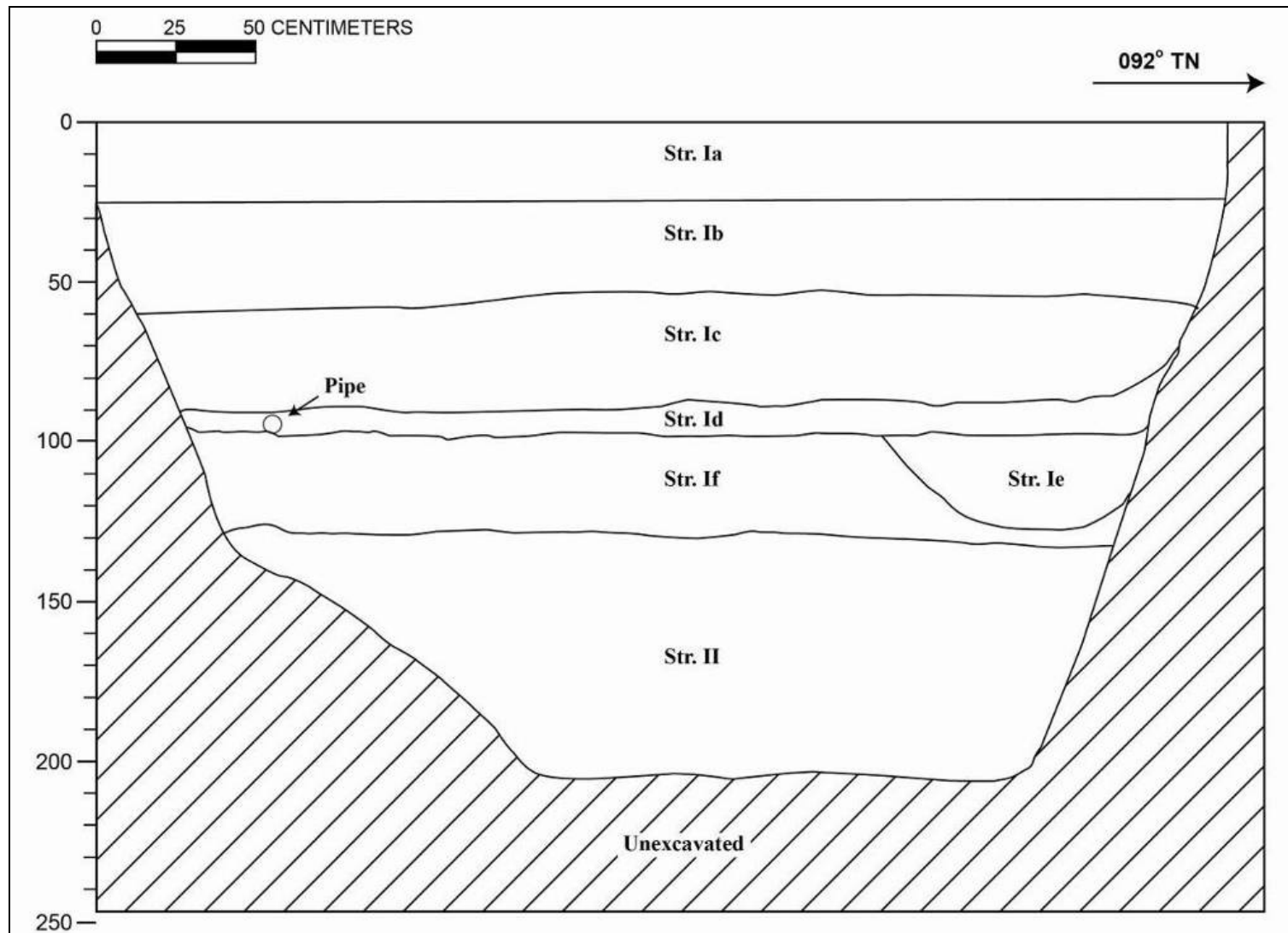


Figure 167. T-028 north profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-25	Fill; gravelly loam; 5 YR 3/3 (dark reddish brown); weak, fine, blocky structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; common, fine roots
Ib	25-58	Fill; very gravelly cobbly loam; 10 YR 6/4 (light yellowish brown); fine, crumb structure; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common, fine roots; contains concrete and asphalt
Ic	58-90	Fill; very gravelly sandy loam; 10 YR 7/3 (very dark brown); fine, crumb structure; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few, fine roots
Id	90-99	Fill; gravelly loam; 10 YR 4/4 (brown); weak, fine, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; few, very fine roots; contains coral and a metal pipe
Ie	99-128	Fill; gravelly cobbly loam; 10 YR 6/6 (brownish yellow); weak, fine, crumb structure; moist, friable consistency; slightly plastic; mixed origin; abrupt, broken/discontinuous lower boundary; contains coral
If	99-130	Fill; very gravelly sandy loam; 10 YR 8/2 (very pale brown); single-grain, structureless; moist, very friable consistency; non-plastic; marine origin; abrupt, smooth lower boundary
II	130-205	Natural; volcanic tuff; 10 YR 3/2 (dark grayish brown) with mottles (clay bands) of 10 YR 7/2 (light gray); moderate, medium, platy structure; moist, friable to firm consistency; non-plastic; terrigenous origin; lower boundary not visible; consists of multiple bands of varying composition including indurated platy rock

7.2.29 Test Excavation 29

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-003: 017
Street:	Aolele Street
Owner:	State DOT Airports Division
Elevation:	4.7 m
UTM:	612600.7411 mE 2359417.322 mN
Max Length/ Width/ Depth:	6.70 m / 0.62 m / 1.38 m
Orientation:	98/278 TN
Targeted Project Component:	Utility corridor
USDA Soil Designation:	Fill Land (FL)

Setting: Test Excavation 29 (T-029) was located in the Enterprise Car Return area on the *makai*/'Ewa corner of Aolele Street and Aolewa Place (see Figure 164 and Figure 168). The excavation area is slightly elevated in relation to the surrounding land surface.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area of T-029 was largely underdeveloped pasture land. By the 1900s the railway and irrigation improvements allowed development - particularly of Honolulu Plantation sugar cane fields. T-029 appears to be located within former sugar cane "Field 7" of the Honolulu Plantation (see Figure 17). The 1933 map (Figure 16) shows no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (Figure 19), however, shows expansive residential and infrastructural development in the immediate area (particularly to the west) associated with military development during the beginning of WWII. This area was developed into a substantial residential subdivision "Damon Tract" in the early 1950s (see Figure 20).

Documentation Procedures: T-029 was excavated to a depth of 138 cmbs. Excavation was halted due to the presence of an indurated coral shelf.

Stratigraphic Summary: The stratigraphy, presented in Figure 169 and Figure 170, consisted of asphalt (Stratum Ia) and associated base course fill (Stratum Ib) overlying natural silty clay loam to the coral shelf. Stratum II appears to have been previously disturbed or reworked natural sediment. The stratigraphy generally conforms to the USDA soil survey designation of Fill Land (FL), with the exception of natural sediment (Stratum II) overlying the coral shelf.

Artifacts Discussion: 2 small glass fragments were identified from T-029 within Stratum II.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: A bulk sediment sample was collected from Stratum II (107-135 cmbs) in order to compare the sediment (Stratum II) to natural sediment collected in other nearby excavations. Wet-screening of the sediment identified tiny snail fragments, some organics, and small coral and basalt gravel. The contents of Stratum II are similar to natural deposits that have been documented in nearby excavations. The sample also contained 2 small glass fragments, indicative of historic disturbance.

GPR Discussion: A review of amplitude slice maps indicates no linear features which might indicate the presence of utilities. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-029 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 20 cmbs and again around 80 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 130 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-029 consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib) overlying previously disturbed or reworked natural silty clay loam (Stratum II) to the coral shelf. The stratigraphy generally conforms to the USDA soil survey designation of Fill Land (FL), with the exception of natural sediment (Stratum II) overlying the coral shelf. A bulk sediment sample was collected from Stratum II (107-135 cmbs) in order to compare the sediment (Stratum II) to natural sediment collected in other nearby excavations. A comparison of natural sediments indicated that the contents of Stratum II are similar to natural deposits that have been documented in nearby excavations. The sample also contained 2 small glass fragments, indicative of historic disturbance. As T-029 is located within the previous sugar cane "Field 7" of the Honolulu Plantation, it is possible that the disturbance or reworking evident in this stratum is associated with historic agricultural activity.



Figure 168. Photograph of Airport Section, T-029, general location. View to northwest



Figure 169. Photograph of Airport Section, T-029, general view of profile, view to west

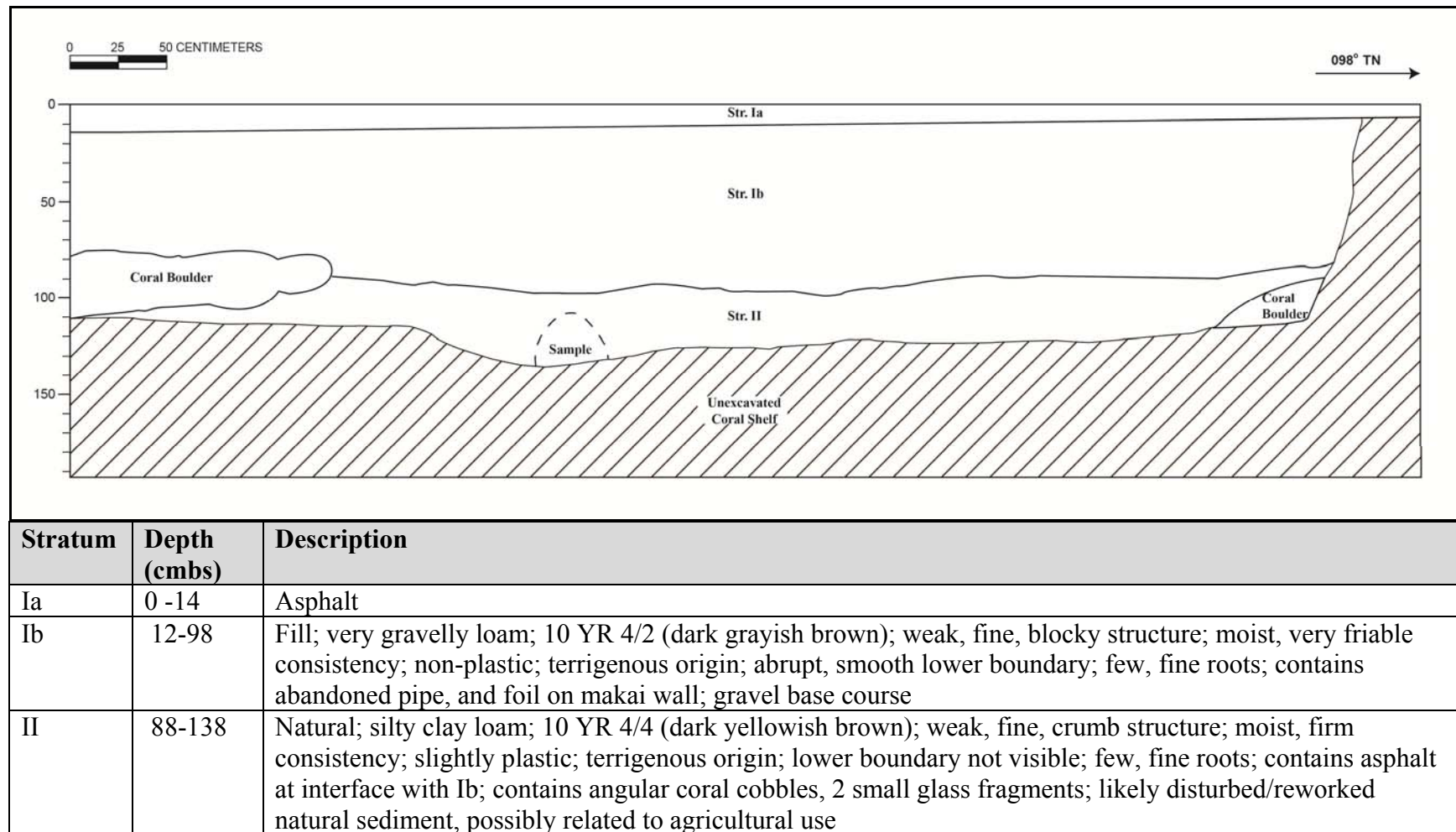


Figure 170. T-029 northeast profile and stratigraphic description

7.2.30 Test Excavation 30

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-003: 001
Street:	Aolele Street
Owner:	State DOT Airports Division
Elevation:	2.9 m
UTM:	613299.904 mE 2359373.549 mN
Max Length/ Width/ Depth:	3.60 m / 1.08 m / 3.05 m
Orientation:	106/286 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Fill Land (FL)

Setting: Test Excavation 30 (T-030) was located north (*mauka*) of Aolele Street on a slight incline below the surrounding land surface (see Figure 172 and Figure 173).

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area of Test Excavation 30 was largely underdeveloped pasture land. By the 1900s the railway and irrigation improvements allowed development, particularly of Honolulu Plantation sugar cane fields. Test Excavation 27 appears to be located within former sugar cane “Field 7” of the Honolulu Plantation (see Figure 17). The 1933 map (Figure 16) shows virtually no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (Figure 19), however, shows expansive residential and infrastructural development in the immediate area (particularly to the west) associated with military development during the beginning of WWII. This area was developed into a substantial residential subdivision “Damon Tract” in the early 1950s (see Figure 20).

Documentation Procedures: T-030 was excavated to a depth of 305 cmbs. Shoring was installed in order for archaeologists to enter the trench and investigate the lower stratigraphic layers.

Stratigraphic Summary: The stratigraphy, presented in Figure 174 and Figure 175, consisted of very gravelly silty loam fill (Stratum Ia), very gravelly cobbly sandy loam (Stratum Ib), gravelly sandy loam fill (Stratum Ic), very cobbly loam fill (Stratum Id), and gravelly loam fill (Stratum Ie) to the base of excavation. Stratum Ib contained faunal skeletal material. Stratum Id contained angular basalt cobbles and cobble-sized asphalt inclusions. The stratigraphy conforms to the USDA soil survey designation of Fill Land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: Faunal skeletal remains included a butchered goat/sheep (*Orvis* sp. / *Aries* sp.) bone collected at 40 cmbs within Stratum Ib, and a butchered pig (*Sus scrofa*) collected at 40 cmbs within the fill pit associated with the PVC pipe at the interface of Stratum Ib. Both appear to have been cut with a metal blade and are considered to be post-Contact food refuse.

Other Lab Results: Two samples were collected, one from Stratum Id (156-175 cmbs) and the other from Stratum Ie (187-217 cmbs). Samples were collected for comparative purposes (comparison between strata for other trenches).

GPR Discussion: A review of amplitude slice maps indicates a linear feature around 25-50 cmbs which corresponds to a utility that was encountered during excavation. Reflectivity is relatively uniform throughout the grid and decreases with depth except for the area that contained the utility. A transition from higher reflectivity to lower reflectivity is observed at approximately 75 cmbs.

GPR depth profiles for T-030 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. An anomaly was observed in the GPR profile and corresponds to the utility encountered during excavation. The maximum depth of clean signal return was approximately 125 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-030 consisted of multiple fill deposits (Stratum Ia to Ie) to the base of excavation at 305 cmbs. The stratigraphy conforms to the USDA soil survey designation of Fill Land (FL). No cultural resources were identified.

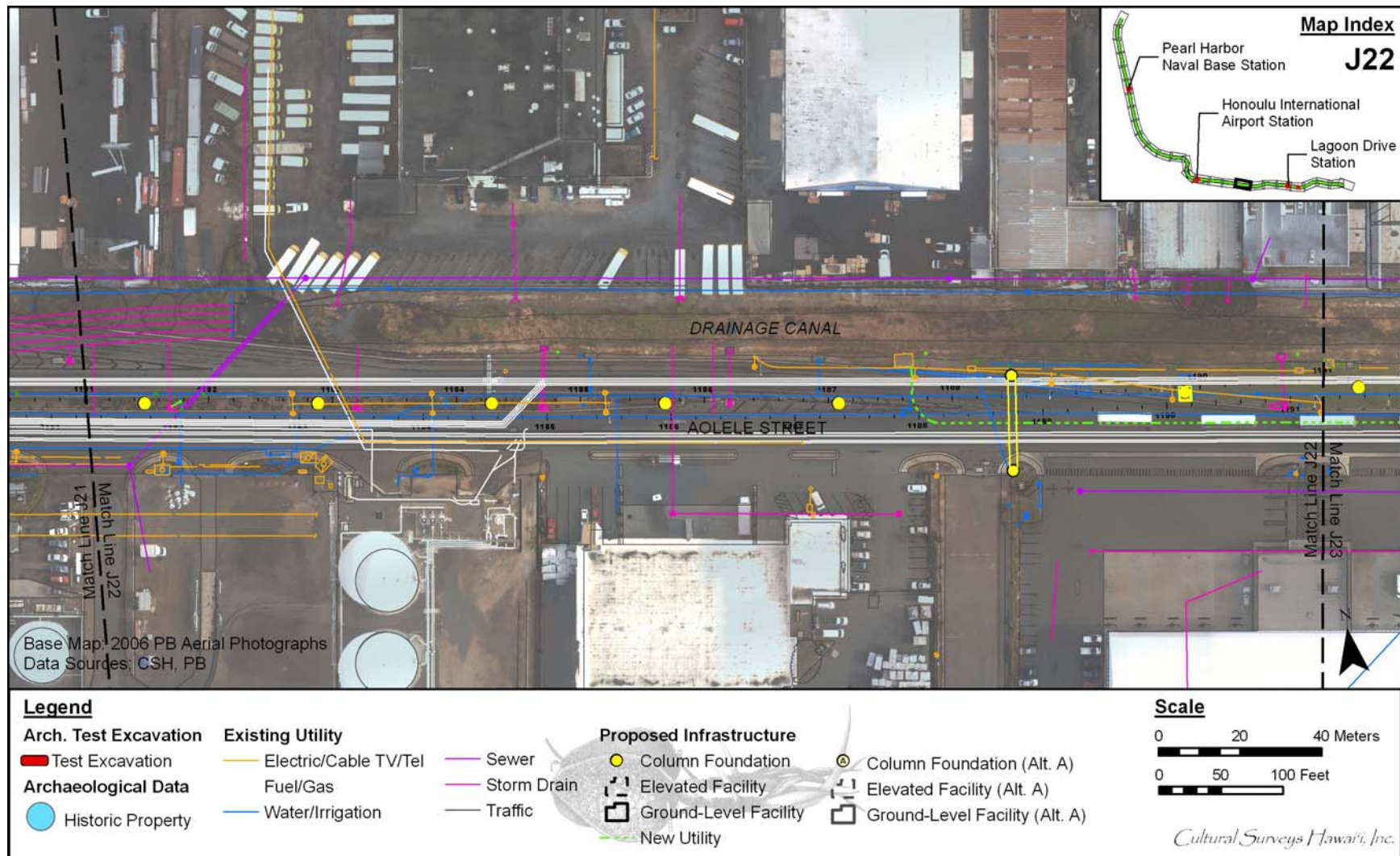


Figure 171. Map Sheet J 22

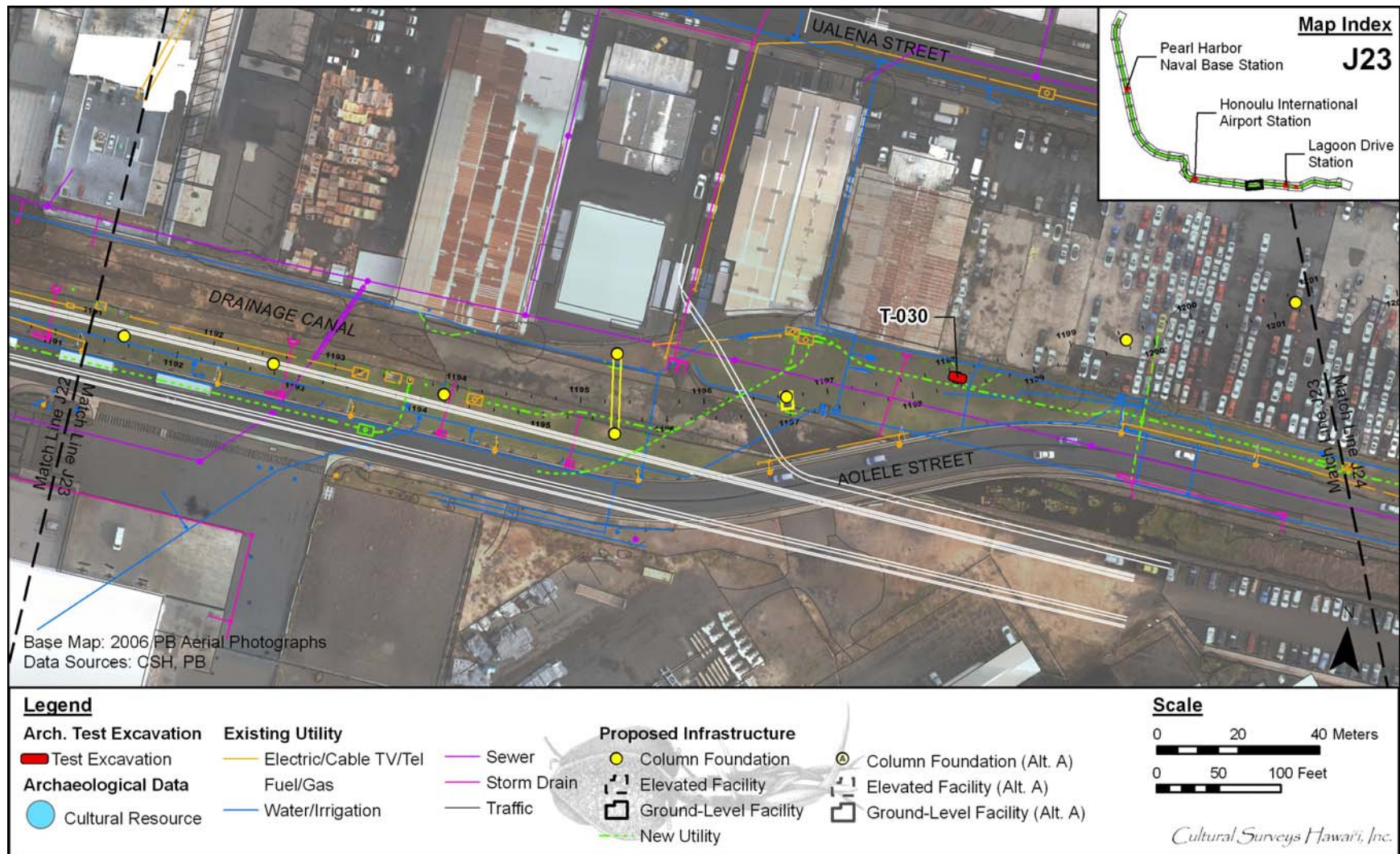


Figure 172. Map Sheet J 23 showing the location of T-030



Figure 173. Photograph of Airport Section, T-030, general location prior to excavation , view to west



Figure 174. Photograph of Airport Section, T-030, general view of profile, view to southwest

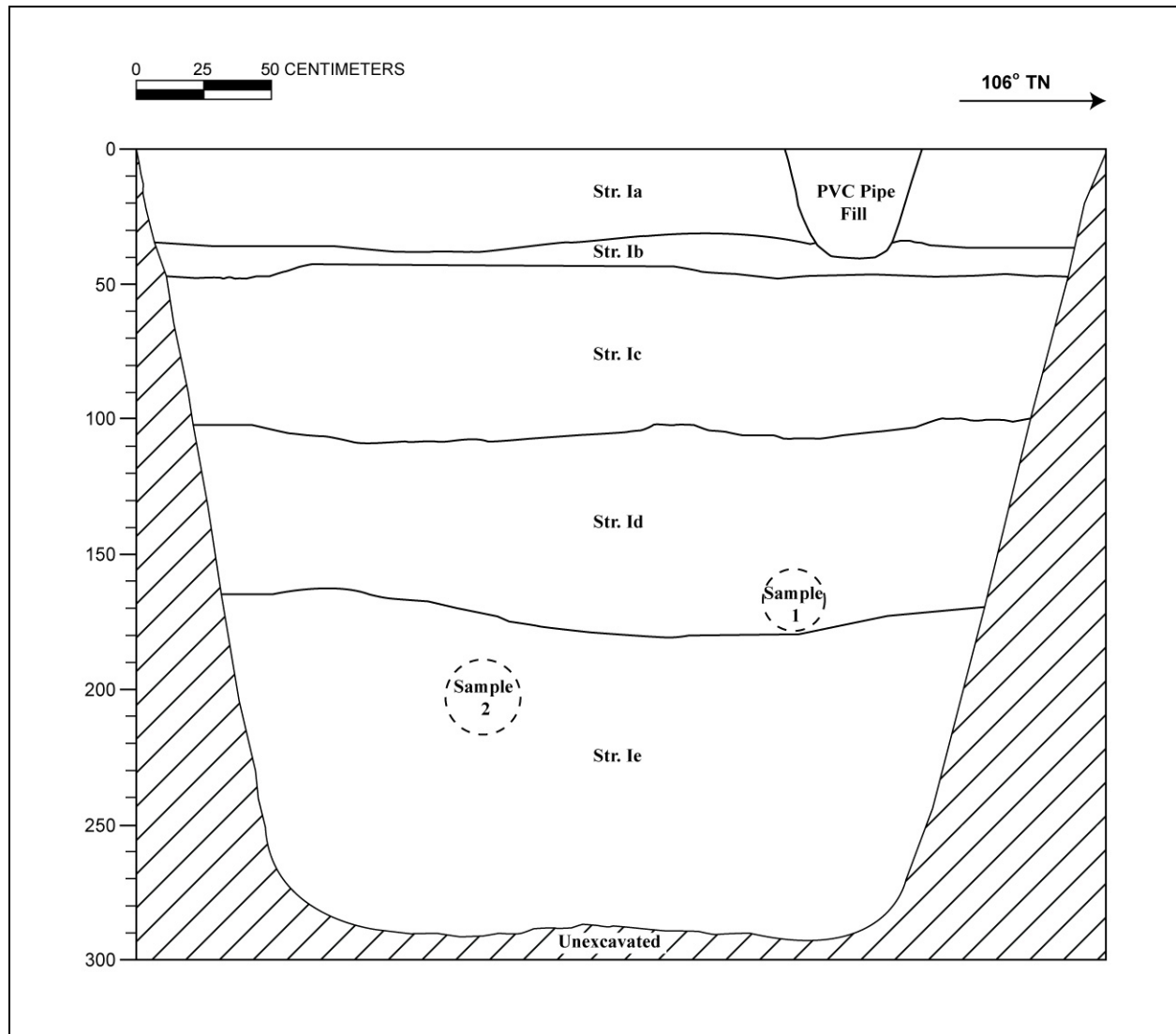


Figure 175. T-030 northeast profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-36	Fill; very gravelly silty loam; 10 YR 3/6 (dark yellowish brown); weak, medium, blocky structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; many, fine roots
Ib	36-43	Fill; very gravelly cobbly sandy loam; 10 YR 7/3 (very pale brown); weak, fine, crumb structure; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few, fine roots; contains PVC irrigation pipe and faunal remains
Ic	43-102	Fill; gravelly sandy loam; 10 YR 6/3 (pale brown); weak, medium, crumb structure; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few, fine roots
Id	102-161	Fill; very cobbly loam; 10 YR 4/4 (dark yellowish brown); moderate, medium, crumb structure; moist, firm consistency; plastic; terrigenous origin; abrupt, smooth lower boundary; few, very fine roots; contains angular basalt/asphalt cobbles
Ie	161-305	Fill; gravelly loam; 10 YR 3/3 (dark brown) with mottles (15%) of 10 YR 8/4 (very pale brown); weak, fine, blocky structure; moist, friable consistency; slightly plastic; mixed origin; lower boundary not visible; contains 15% coral gravel

7.2.31 Test Excavation 31

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-004: 012
Street:	Ualena Street
Owner:	State DOT Airports Division
Elevation:	2.9 m
UTM:	613521.3002 mE 2359404.477 mN
Max Length/ Width/ Depth:	3.0 m / 0.95 m / 0.66 m
Orientation:	10/190 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Keaau Stony Clay (KmaB)

Setting: Test Excavation 31 (T-031) was located in a parking lot on the south (*makai*) side of Ualena Street (see Figure 176 and Figure 177). The excavation was level with the surrounding asphalt surface.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area of T-031 was largely underdeveloped pasture land. By the 1900s the railway and irrigation improvements allowed development, particularly of Honolulu Plantation sugar cane fields. Test Excavation 27 appears to be located within former sugar cane “Field 7 1/2” of the Honolulu Plantation (see Figure 17). The 1933 map (Figure 16) shows a number of houses in this area with Kaloaoa Fishpond and seemingly a number of smaller related ponds just 250 m to the south. The 1943 War Department Aiea quad map (Figure 19), shows expansive residential and infrastructural development in the immediate area (particularly to the west) associated with military development at the beginning of WWII. The area of T-031 was developed into a substantial residential subdivision “Damon Tract” in the early 1950s (see Figure 20).

Documentation Procedures: T-031 was excavated to a depth of 66 cmbs. Excavation was terminated after exposing the indurated coral shelf.

Stratigraphic Summary: The stratigraphy, presented in Figure 178 and Figure 179, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib), extremely gravelly cobbly loam fill (Stratum Ic), loam fill (Stratum Id), crushed coral fill (Stratum Ie), and very gravelly loam fill (Stratum If) overlying natural loam (Stratum II) and the coral shelf (Stratum III). Stratum II appears to conform with the USDA soil survey designation of Keaau Stony Clay (KmaB), however the upper boundary of Stratum II appears to have been previously disturbed or reworked.

Artifacts Discussion: No artifacts were collected.

Features Discussion: Observed Feature 1 at the southern end of trench as a modern or historic fill pit.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: A small bulk sample of natural sediment (Stratum II) was collected in order to further characterize the natural sediment and to screen for content. Wet-screening results were negligible. A sample was also collected from Stratum Id in order to verify the potential taxa and age represented by the charcoal content. The charcoal collected from this stratum was submitted for taxa analysis and radiocarbon dating, which confirmed a historic (post-Contact) depositional age (see Sections 8.4 and 8.5).

GPR Discussion: A review of amplitude slice maps does not clearly indicate any linear features although a utility was encountered during excavation. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-031 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile but a utility was encountered during excavation. The maximum depth of clean signal return was approximately 125 cmbs. (see Appendix E for more details).

Summary: The stratigraphy within T-031 consisted of fill (Stratum Ia to If) overlying natural loam (Stratum II) to the coral shelf (Stratum III). A bulk sample of Stratum II was collected and wet-screened with no significant results. A sample of Stratum Id was collected in order to verify the potential taxa and age represented by the charcoal content. The charcoal collected from this stratum was submitted for taxa analysis and radiocarbon dating, which confirmed a historic (post-Contact) depositional age (see Sections 8.4 and 8.5). No cultural resources were identified.

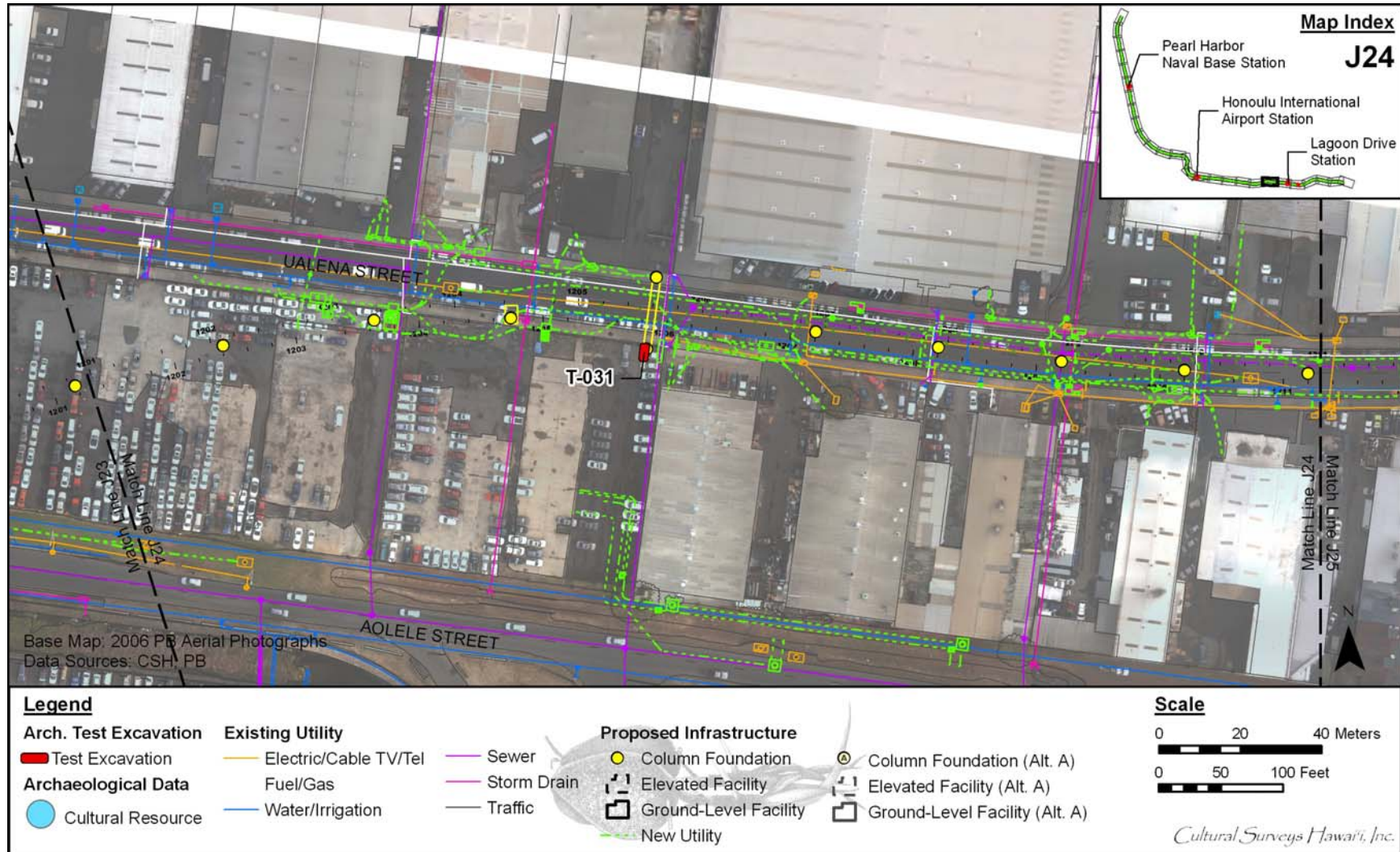


Figure 176. Map Sheet J 24 showing the location of T-031



Figure 177. Photograph of Airport Section, T-031, general location, view to east



Figure 178. Photograph of Airport Section, T-031, general view of profile, view to southeast

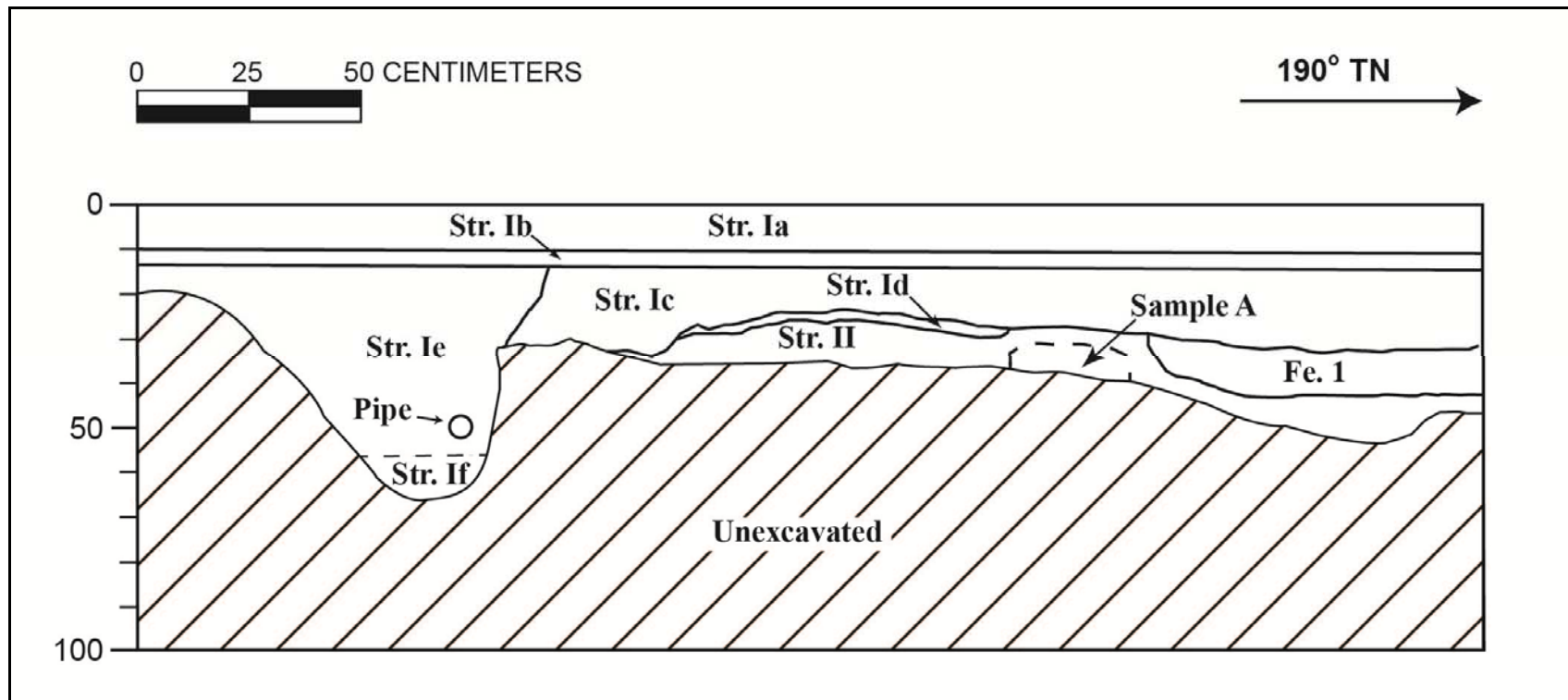


Figure 179. T-031 east profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt; parking lot surface
Ib	10-13	Fill; crushed coral; very abrupt, smooth lower boundary; base course
Ic	13-34	Fill; extremely gravelly cobbly loam; 10 YR 4/4 (dark yellowish brown); weak, fine-medium, crumb structure; moist, very friable consistency; slightly plastic; mixed origin; clear, smooth lower boundary; mixed fill
Id	23-30	Fill; loam; 5 YR 4/4 (reddish brown) with mottles (30%, thin layers) of YR 4/6 (red) and (80%, ash-like) 10 YR 2/2 (very dark brown); moderate, very fine, crumb structure; moist, friable consistency; slightly plastic; mixed origin; clear, broken/discontinuous lower boundary; contains abundant charcoal fragments
Ie	57- 66	Fill; crushed coral fill around pipe with sandy silt matrix; moist consistency; mixed origin; utility line fill
If	13-57	Fill; very gravelly loam; 10 YR 4/3 (brown); weak, fine-medium, granular structure; moist, very friable consistency; slightly plastic; mixed origin; diffuse, smooth lower boundary; utility line fill
II	26-53	Natural; loam; 7.5 YR 4/6 (strong brown) with mottles (30%, lattice) of 2.5 YR 4/6 (red); moderate, very fine, blocky structure; moist, friable consistency; plastic; terrigenous origin; very abrupt, wavy lower boundary; few, very fine roots; natural silty clay loam with disturbance at upper boundary
III	20-66	Natural; Coral shelf bedrock; massive structure; indurated; marine origin; lower boundary not visible

7.2.32 Test Excavation 32

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-016: 012, 014-016
Street:	Waiwai Loop
Owner:	Chevron USA Inc.
Elevation:	2.4 m
UTM:	613922.1063 mE 2359363.674 mN
Max Length/ Width/ Depth:	6.75 m/ 0.72 m/ 1.33 m
Orientation:	100/280 TN
Targeted Project Component:	Lagoon Drive Station
USDA Soil Designation:	Ewa silty clay loam (EwA)

Setting: Test Excavation 32 (T-032) was located in the parking lot of a Chevron station on the *makai*/Diamond Head corner of Waiwai Loop and Lagoon Drive (see Figure 180. Figure 181 and Figure 183).

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area of T-032 was largely underdeveloped. By the 1900s the railway and irrigation improvements facilitated development of extensive Honolulu Plantation sugar cane fields but it appears these fields did not extend east as far as Test Excavation 32 (see Figure 17). A 1906 map (Figure 13) indicates that there may have been an area of taro or rice just to the northwest. The 1933 map (Figure 16) shows a number of houses in this area with Kaloaoa Fishpond and seemingly a couple of smaller related ponds just 250 m to the southwest. The 1943 War Department Aiea quad map (Figure 19) shows expansive residential and infrastructural development in the immediate area (particularly to the west) associated with military development at the beginning of WWII. This 1943 map documents the relatively rapid land reclamation that occurred with the coastline having been extended more than 500 m to the southeast (with much of the fill having logically come from dredging for the adjacent seaplane runway. The area surrounding T-032 was developed into a substantial residential subdivision "Damon Tract" in the early 1950s (see Figure 20).

Documentation Procedures: A utility line was exposed during excavation at approximately 120 cmbs. Excavation proceeded, by hand, to the coral shelf. Two additional utility lines were encountered during hand excavation beneath the initial utility line discovery.

Stratigraphic Summary: The stratigraphy, presented in Figure 184 and Figure 185, consisted of asphalt (Stratum Ia), gravel base course (Stratum Ib), gravelly sandy loam (Stratum Ic), and previously disturbed natural sandy clay loam (Stratum II) overlying the coral shelf (Stratum III). Stratum II may conform to the USDA soil survey designation of Ewa silty clay loam (EwA).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: A bulk sediment sample of approximately 2 to 3 liters was collected from Stratum II within T-032. The sample was removed from an unmarked location along the south excavation sidewall. The sample was wet-screened yielding no cultural material within the sediment matrix.

GPR Discussion: A review of amplitude slice maps indicates linear features which corresponds to the utilities encountered during excavation. Reflectivity is relatively uniform throughout the grid and decreases with depth except for the area that contained utilities. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-032 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 50 cmbs. Several anomalies were observed in the GPR profile which corresponds to the utilities that were encountered during excavation. The maximum depth of clean signal return was approximately 100 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-032 consisted of fill (Stratum Ia-Ic) overlying previously disturbed natural sandy clay loam (Stratum II) and the coral shelf (Stratum III). Stratum II may conform to the USDA soil survey designation of Ewa silty clay loam (EwA). The natural surface (Stratum II) appears to have been horizontally truncated prior to the deposition of overlying fill sediment. Analysis of a bulk sediment sample that was collected from Stratum II yielded no cultural material. No cultural resources were identified.

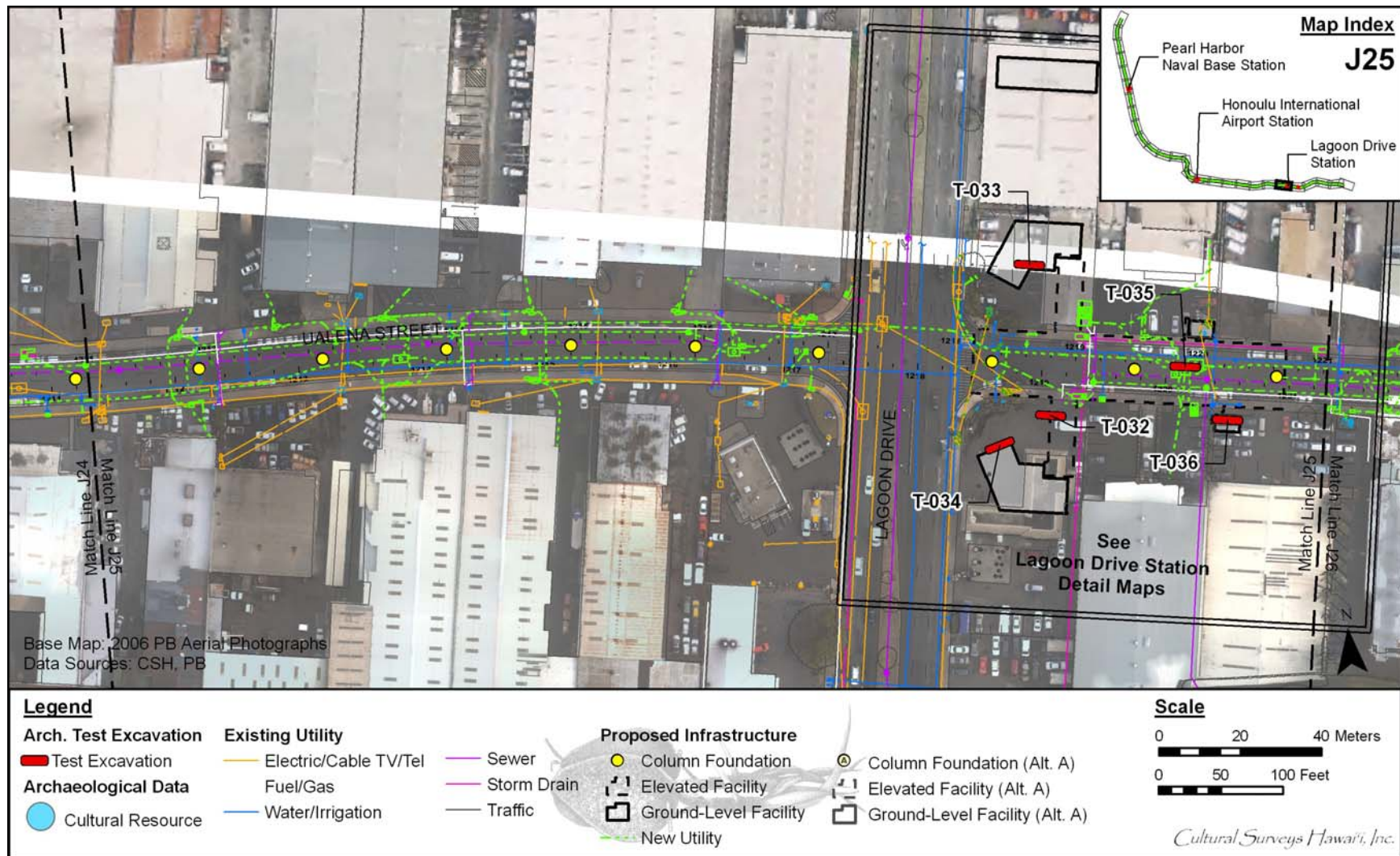


Figure 180. Map Sheet J 25 showing the location of T-032 to T-036

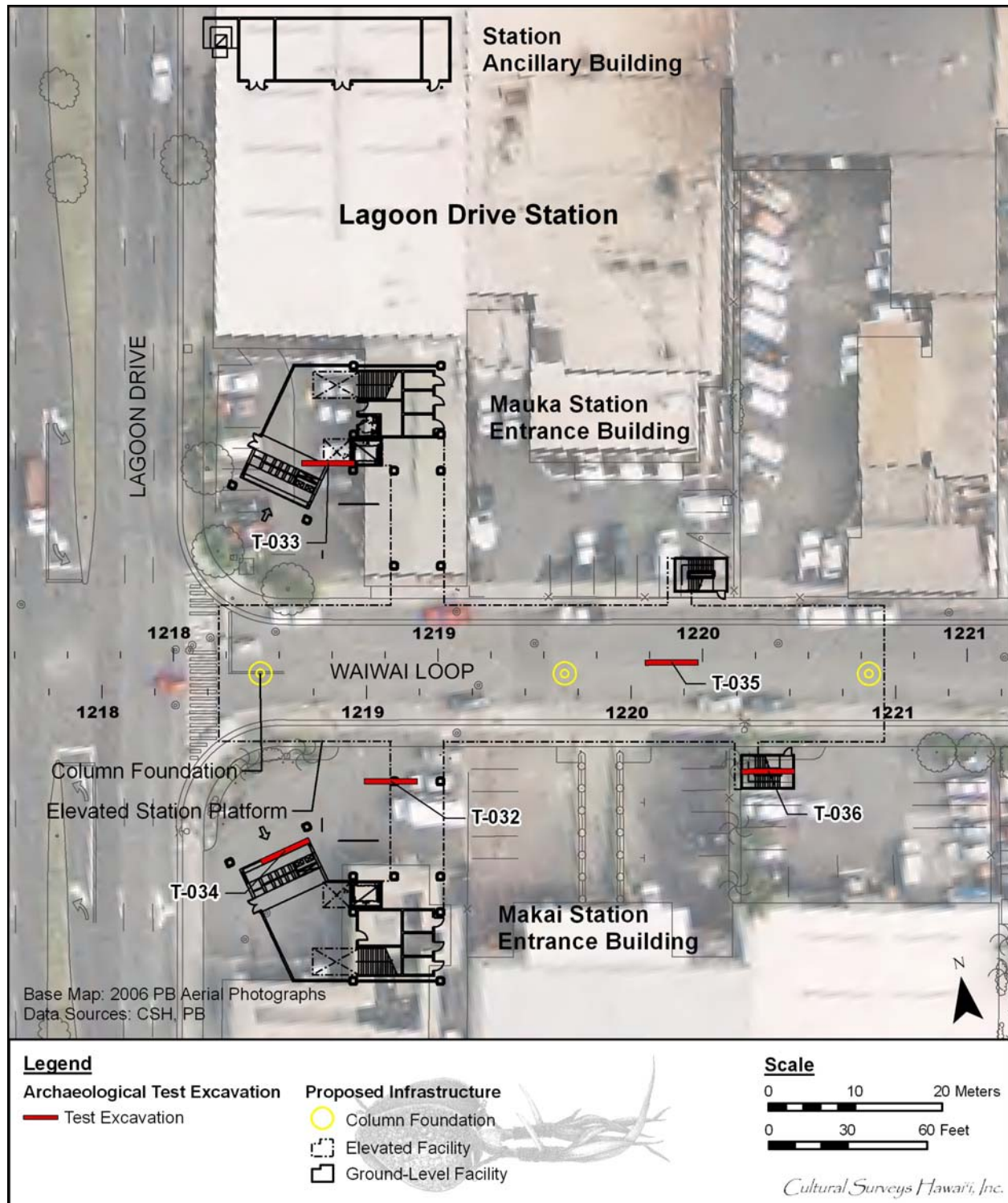


Figure 181. Overall view of Lagoon Drive Station showing the location of T-032 to T-036

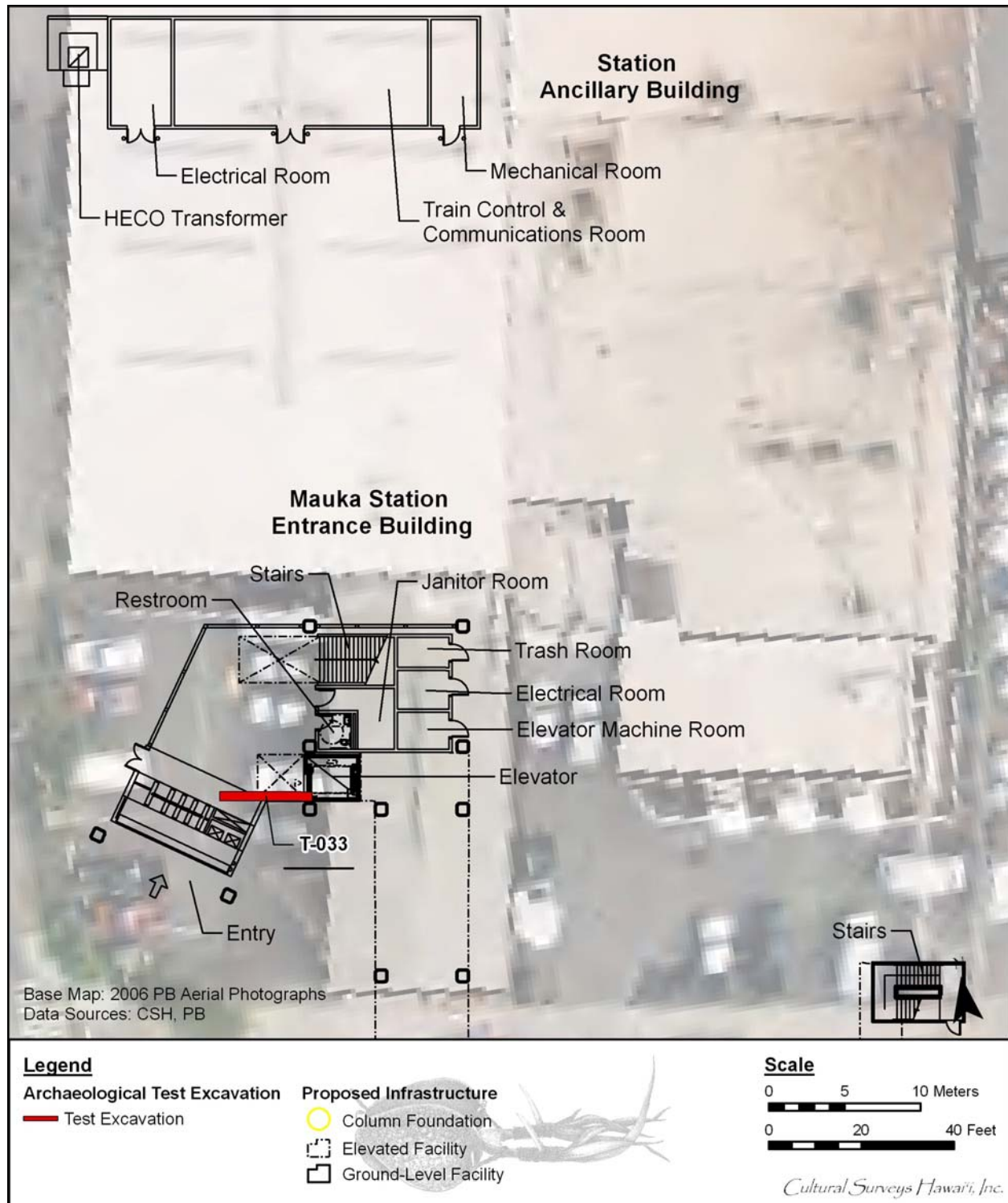


Figure 182. Detail of view of Lagoon Drive Station Mauka Station Entrance Building in relationship to T-033



Figure 183. Photograph of Airport Section, T-032, general location, view to north



Figure 184. Photograph of Airport Section, T-032, general view of profile, view to southeast

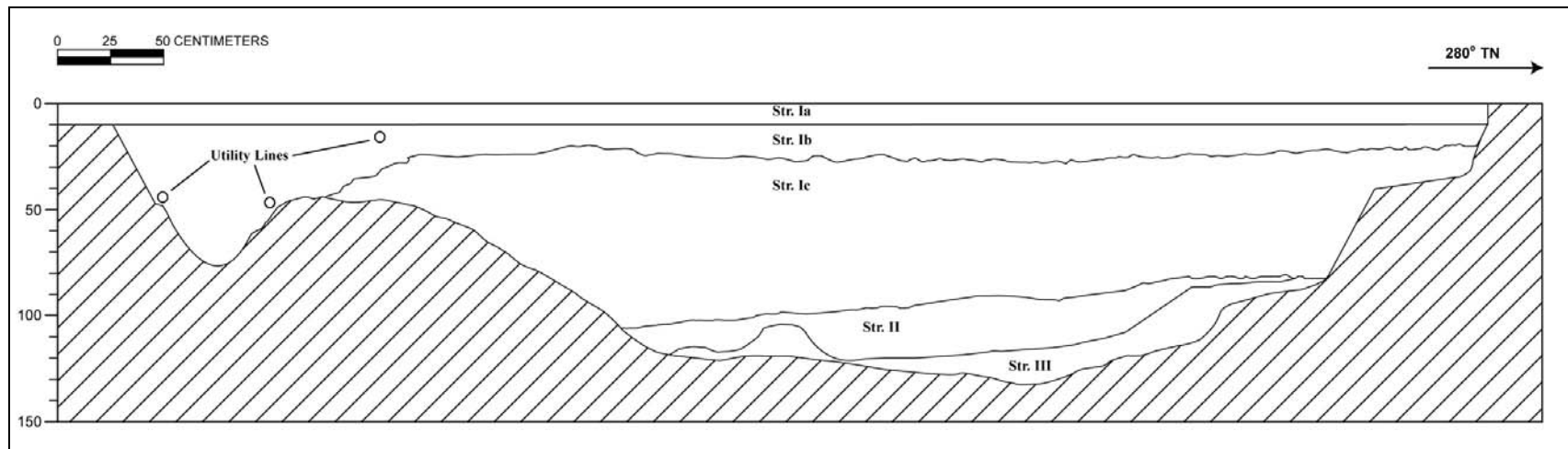


Figure 185. T-032 south profile and stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt
Ib	10-77	Fill; extremely gravelly sand; contains utility lines; base course
Ic	20-105	Fill; gravelly sandy clay loam; 5 YR 4/3 (reddish brown); massive structure; moist, firm consistency; slightly plastic; terrigenous origin; few, very coarse roots; Stratum Ic gravels also surround large root where it emerges from Stratum IIa
II	82-120	Natural; sandy clay loam; 10 YR 3/4 (dark yellowish brown); weak, fine, blocky structure; wet, slightly sticky consistency; slightly plastic; terrigenous origin; clear, wavy lower boundary; few, very coarse roots; contains organic staining
III	82-133	Natural; limestone; marine origin; lower boundary not visible; undulating coral shelf

7.2.33 Test Excavation 33

Ahupua'a:	Moanalua
LCA :	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-016
Street:	Waiwai Loop
Owner:	Brewer, John V. Trust
Elevation:	2.6 m
UTM:	613920.4801 mE 2359401.03 mN
Max Length/ Width/ Depth:	6.4 m/ 0.91 m/ 1.50 m
Orientation:	130/310 TN
Targeted Project Component:	Lagoon Drive Station
USDA Soil Designation:	Ewa silty clay loam (EmA)

Setting: Test Excavation 33 (T-033) was located in the Pacific Courier parking lot on the *mauka*/Diamond Head corner of Waiwai Loop and Lagoon Drive (see Figure 180, Figure 181, Figure 182, and Figure 186). The area is level with the lot and surrounding land.

Summary of Background Research and Land Use: Until the creation of the OR&L in the late 1800s (Figure 12), the area of Test Excavation 33 was largely underdeveloped. By the 1900s the railway and irrigation improvements facilitated development of extensive Honolulu Plantation sugar cane fields but it appears these fields did not extend east as far as T-033 (see Figure 17). A 1906 map (Figure 13) indicates that there may have been an area of taro or rice just to the northwest. This may relate to the presence of *Oriza*-type (rice pollen) pollen within sediment samples collected from T-033 (see Section 8.3). The 1933 map (Figure 16) shows a number of houses in this area with Kaloaoa Fishpond and seemingly a couple of smaller related ponds just 250 m to the southwest. The 1943 War Department Aiea quad map (Figure 19), shows expansive residential and infrastructural development in the immediate area (particularly to the west) associated with military development at the beginning of WWII. This 1943 map documents the relatively rapid land reclamation that occurred with the coastline having been extended more than 500 m to the southeast (with much of the fill having logically come from dredging for the adjacent seaplane runway. This T-033 area was developed into a substantial residential subdivision “Damon Tract” in the early 1950s (see Figure 20).

Documentation Procedures: An electrical line was encountered near the northwest end of T-033 limiting excavation. The remainder of the excavation was completed to coral limestone shelf at 150 cmbs.

Stratigraphic Summary: The stratigraphy, presented in Figure 187 and Figure 188, consisted of asphalt (Stratum Ia), gravel base course (Stratum Ib), very gravelly sandy loam fill (Stratum Ic), gravelly sandy loam fill (Stratum Id), very gravelly to stony loam fill (Stratum Ie), and natural silty clay loam (Stratum II). Survey results confirm the USDA soil designation as remnants of

Ewa clay loam (EmA) were represented by Stratum II. The coral shelf was encountered at the base of excavation.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: A single butchered *Bos taurus* (cow) rib bone was collected at 45 cmbs within Stratum Ie near the center of the excavation.

Other Lab Results: A 2.5-liter bulk sediment sample was collected from Stratum II of T-033 (see Figure 188). A portion of the sediment sample was submitted for pollen analysis (see Section 8.3). The remainder of the sample was wet-screened, which yielded no cultural material.

GPR Discussion: A review of amplitude slice maps indicate a linear feature which corresponds to the utility encountered. Reflectivity is relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity is observed at approximately 50 cmbs.

GPR depth profiles for T-033 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicates a change in reflectivity occurring around 25 cmbs. An anomaly was observed in the GPR profile and corresponds to the utility encountered during excavation. The maximum depth of clean signal return was approximately 110 cmbs. (see Appendix E for more details).

Summary: The stratigraphy of T-033 consisted of numerous fill strata (Stratum Ia to Ie) overlying natural silty clay loam (Stratum II). Stratum II appeared to be consistent with the USDA soil survey designation of Ewa clay loam (EmA). A bulk sediment sample was collected from Stratum II, and a portion of the sediment sample was submitted for pollen analysis (see Section 8.3). The remainder of the bulk sediment sample was wet-screened yielding no significant finds within the sediment matrix. No cultural resources were identified within T-033.



Figure 186. Photograph of Airport Section, T-033, general location, view to southeast



Figure 187. Photograph of Airport Section, T-033, general view of profile, view to WNW

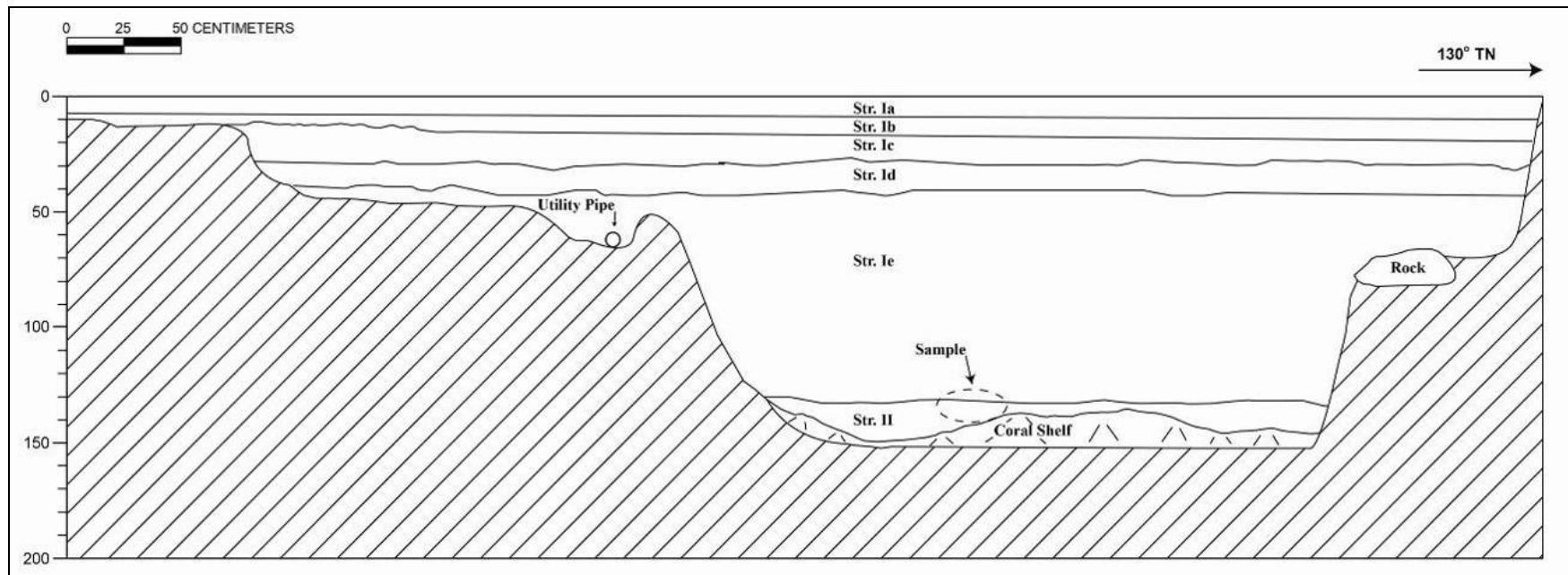


Figure 188. T-033 northeast profile (above) and stratigraphic description (below)

Stratum	Depth (cmts)	Description
Ia	0-9	Asphalt
Ib	9-19	Fill; extremely gravelly loam; 10 YR 6/1 (gray); weak, fine to medium, blocky structure; moist, friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ic	19-29	Fill; very gravelly sandy loam; 5 YR 4/4 (reddish brown); weak, fine, crumb structure; moist, friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary
Id	29-40	Fill; gravelly sandy loam; 10 YR 4/2 (dark grayish brown); weak, fine, crumb structure; moist, friable consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; contains a thin band of asphalt near upper boundary
Ie	40-128	Fill; very gravelly to stony loam; 5 YR 3/4 (dark reddish brown); weak, fine-medium, crumb structure; moist, friable consistency; non-plastic, a single cow rib bone was identified at 45 cmts; terrigenous origin; abrupt, smooth lower boundary; contains large angular basalt boulders
II	128-150	Natural; silty clay loam; 10 YR 4/4 (dark yellowish brown); weak, medium, blocky structure; moist, firm consistency; slightly plastic; terrigenous origin; lower boundary not visible; contains charcoal flecking

7.2.34 Test Excavation 34

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-016:012, 014-016
Street:	Waiwai Loop
Owner:	Chevron USA, Inc.
Elevation:	2.7 m
UTM:	613908.8522 mE 2359357.551 mN
Max Length/Width/Depth:	6.73 m/0.65 m/1.51 m
Orientation:	256/76 TN
Targeted Project Component:	Lagoon Drive Station
USDA Soil Designation:	Ewa silty clay loam (EmA)

Setting: Test Excavation 34 (T-034) was located in a Chevron station on the *makai*/Diamond Head corner of Waiwai Loop and Lagoon Drive (see Figure 180, Figure 181, and Figure 190).

Summary of Background Research and Land Use: Until the creation of the OR&L railway in the late 1800s (see Figure 12), the area around T-034 was largely underdeveloped even though this test area would have been only a few hundred meters from “Moanalua Bay” to the southeast. By the 1900s, the railway and irrigation improvements furthered development of extensive Honolulu Plantation sugar cane fields but it appears these fields did not extend as far east as T-034 (see Figure 17). A 1906 map (see Figure 13) indicates that there may have been an area of taro or rice just to the northwest. This may relate to identification of *Oriza*-type (rice) pollen in nearby excavations T-022 and T-033. The 1933 map (see Figure 16) shows a number of houses in this area with Kaloaoa Fishpond and seemingly a couple of smaller related ponds just 250 m to the southwest. The 1943 War Department Aiea quad map (Figure 19) shows a burst of recent residential and infrastructural development in the immediate area (particularly to the west) associated with military development during the beginning of WWII. This 1943 map documents the relatively rapid land reclamation that occurred with the coastline having been pushed out more than 500 m to the southeast (with much of the fill having logically come from dredging for the adjacent seaplane runway). The area around T-034 was developed into a substantial residential subdivision, “Damon Tract” in the early 1950s (see Figure 20).

Documentation Procedures: The excavation documented natural coral shelf bedrock varying in depth from 55-151cmbs.

Stratigraphic Summary: The stratigraphy, presented in Figure 191 and Figure 192, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib) and very gravelly loam fill (Stratum Ic) overlying natural clay loam (Stratum II) and natural sandy clay loam (Stratum II) to the coral shelf (Stratum IV). Stratum II appears to conform to the USDA soil survey designation of Ewa silty clay loam (EmA).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: A trace (<0.1 g) of non-diagnostic fish bone was observed in Stratum II (49-126 cmbs).

Other Lab Results: A bulk sediment sample of Stratum II was collected from the sidewall of the excavation. This sample was wet-screened for potential charcoal content and other cultural material and produced traces (<0.1 g) of unidentifiable shell fragments and organic filaments.

GPR Discussion: A review of amplitude slice maps indicated no linear features, which might indicate the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 75 cmbs.

GPR depth profiles for T-034 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area (see Figure 109). This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 40 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 115 cmbs (see Appendix E for more details).

Summary: The stratigraphy present within T-034 consisted of fill (Stratum Ia to Ic) overlying relatively thick (77 cm) naturally deposited clay loam (Stratum II) and sandy clay loam (Stratum III) to the coral shelf (Stratum IV). Stratum II appears to conform to the USDA soil survey designation of Ewa silty clay loam (EmA). A bulk sediment sample collected from Stratum II was wet-screened, which identified traces of unidentifiable shell fragments and organic filaments. The relative thickness of Stratum II may relate to alluvial deposition at the mouths of the Moanalua/Kahauiki/Kalihi Streams in an area that appears to have been relatively less disturbed by military activity (which occurred further west) during WWII. No cultural resources were identified.

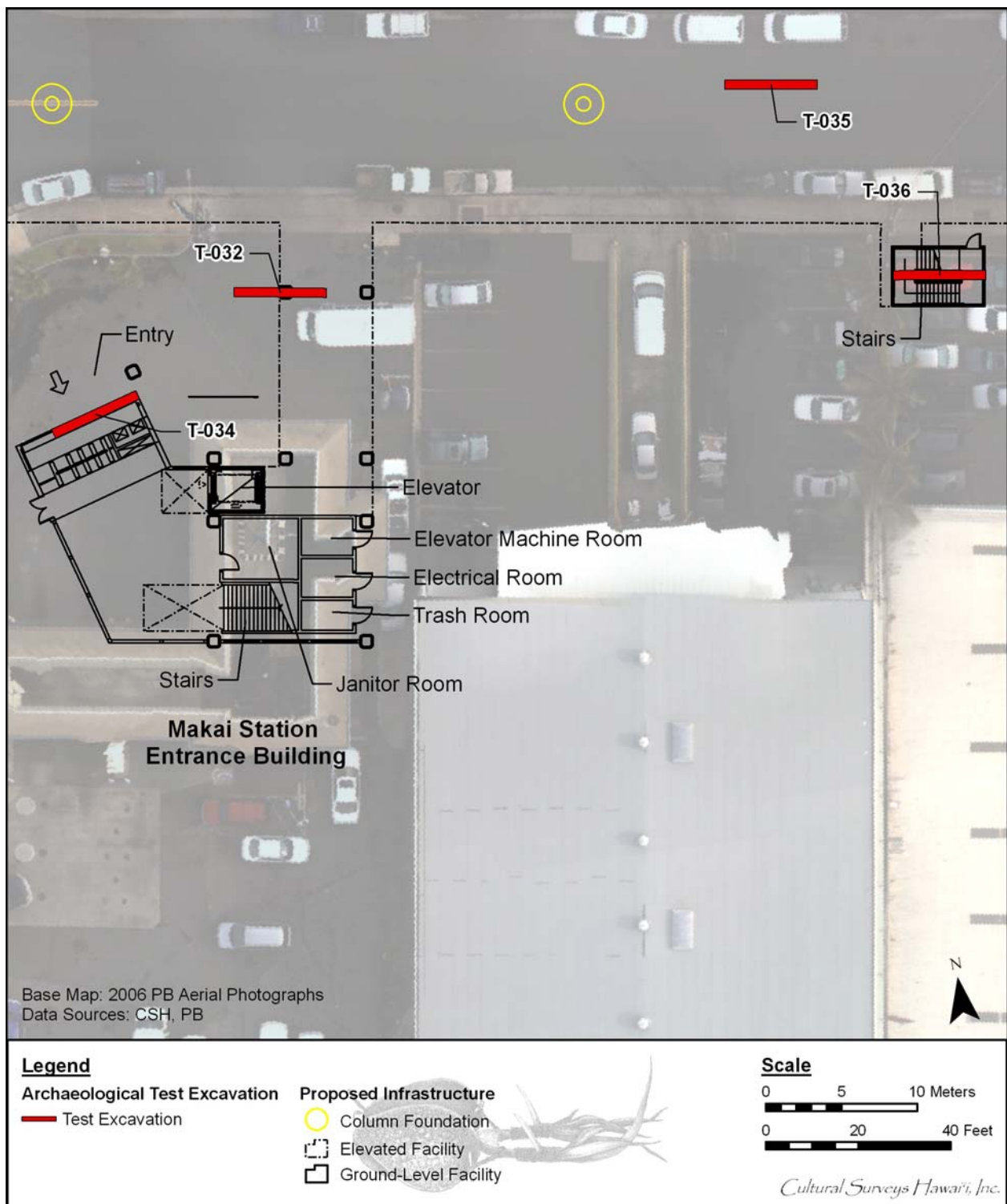


Figure 189. Lagoon Station Makai Station Entrance Building



Figure 190. Photograph of Airport Section, T-034, general location, view to northwest

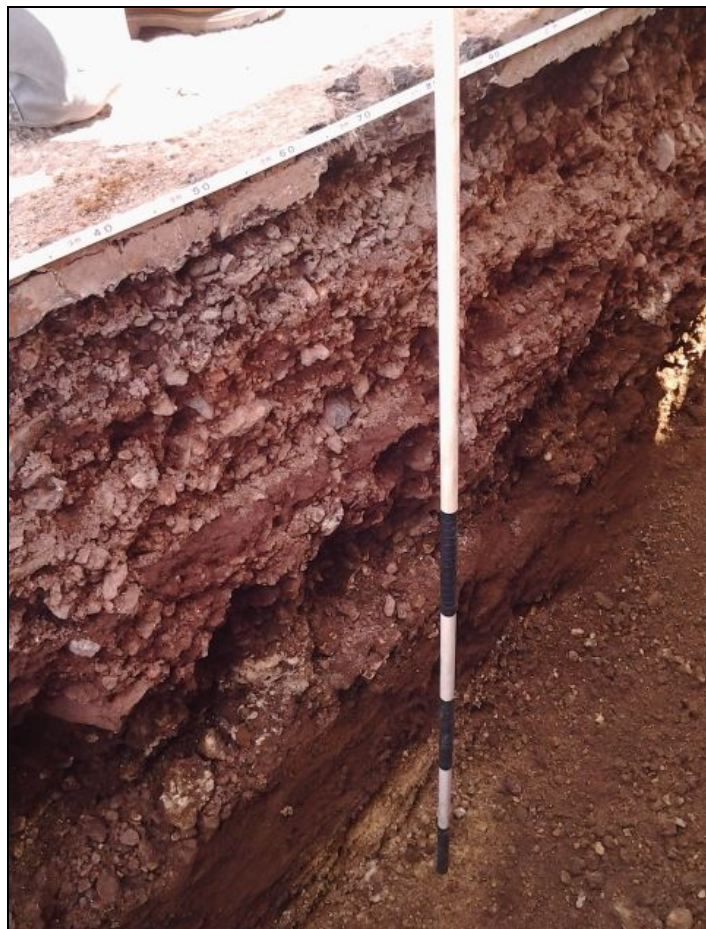


Figure 191. Photograph of Airport Section, T-034, general view of profile, view to northeast

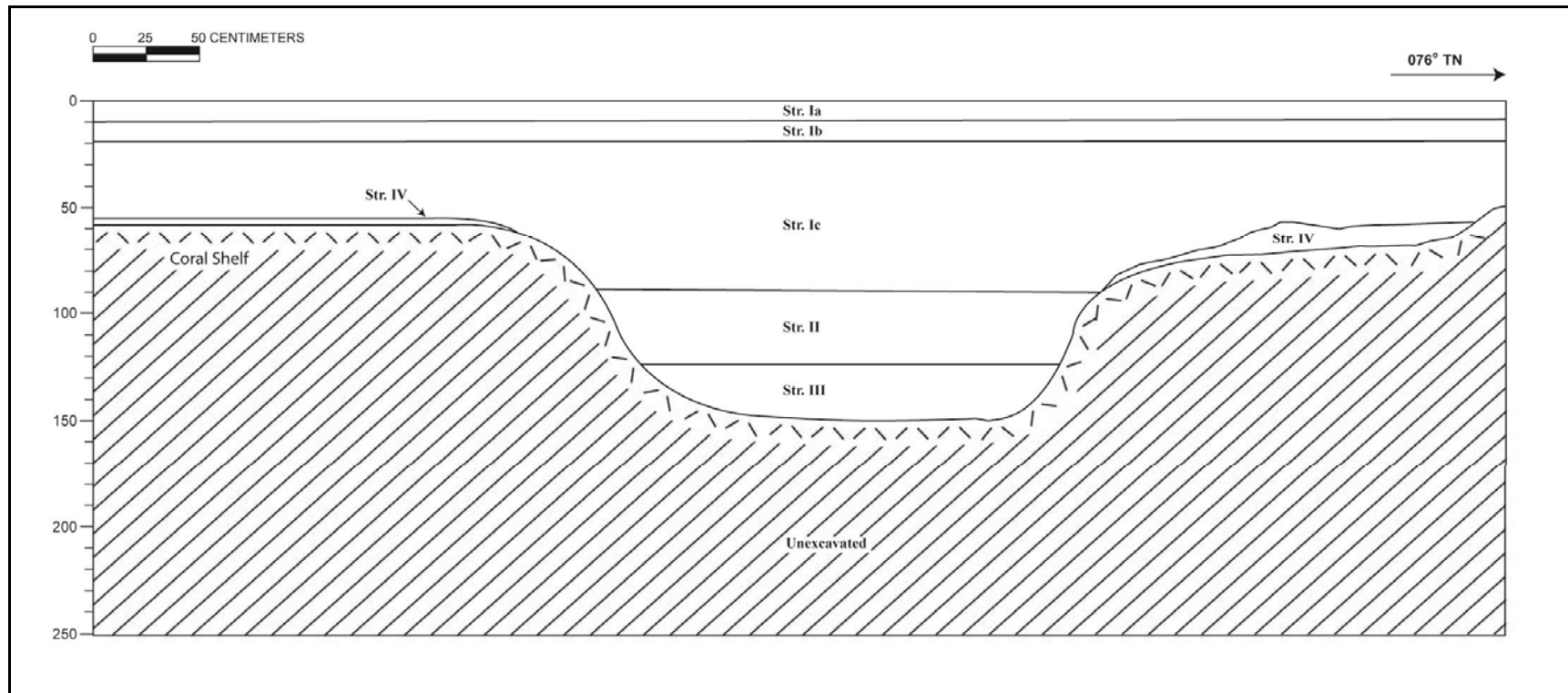


Figure 192. T-034 north profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt
Ib	10-20	Fill; very gravelly sandy loam; 10 YR 4/2 (dark grayish brown); structureless; dry, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ic	19-52	Fill; very gravelly loam; 5 YR 4/3 (reddish brown); structureless; dry, loose consistency; non-plastic; terrigenous origin; very abrupt, smooth lower boundary; contains chunks of concrete, asphalt, and coral; grading fill
II	49-126	Natural; clay loam; 10 YR 4/3 (dark brown); weak, medium, blocky (subangular) structure; moist, friable consistency; plastic; terrigenous origin, a trace (<0.1 g) of non-diagnostic fish bone was observed; clear, smooth lower boundary
III	124-151	Natural; gravelly sandy clay loam; 7.5 YR 5/4 (brown) with mottles of 10 YR 4/2 (dark grayish brown); weak, fine, blocky (subangular) structure; moist, loose consistency; plastic; mixed origins; contains 20% fine coral gravels
IV	55-151	Natural; limestone; 10 YR 8/2 (very pale brown); massive structure; indurated; non-plastic; marine origin; lower boundary not visible; decomposing coral shelf

7.2.35 Test Excavation 35

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-016:012, 014-016
Street:	Waiwai Loop
Owner:	City & County of Honolulu
Elevation:	2.5 m
UTM:	613956.1524 mE 2359372.351 mN
Max Length/Width/Depth:	7.35 m/0.70 m/1.80 m
Orientation:	90/270 TN
Targeted Project Component:	Lagoon Drive Station
USDA Soil Designation:	Ewa silty clay loam (EmA)

Setting: Test Excavation 35 (T-035) was located on the south (*makai*) side of Waiwai Loop, approximately 50 m east of Lagoon Drive (see Figure 180, Figure 181, and Figure 193). The excavation area is level with the surrounding surface.

Summary of Background Research and Land Use: Until the creation of the OR&L railway in the late 1800s (see Figure 12), the area of T-035 was largely underdeveloped even though this test area would have been only a few hundred meters from “Moanalua Bay” to the southeast. By the 1900s, the railway and irrigation improvements furthered development of extensive Honolulu Plantation sugar cane fields but it appears these fields did not extend east as far as T-035 (see Figure 17). A 1906 map (see Figure 13) indicates that there may have been an area of taro or rice just to the northwest. This may relate to identification of *Oriza*-type (rice) pollen in nearby excavations T-022 and T-033. The 1933 map (see Figure 16) shows a number of houses in this area with Kaloaoa Fishpond and seemingly a number of smaller related ponds just 250 m to the southwest. The 1943 War Department Aiea quad map (see Figure 19) shows expansive residential and infrastructural development in the immediate area (particularly to the west) associated with military development during the beginning of WWII. This 1943 map documents the relatively rapid land reclamation that occurred with the coastline having been extended more than 500 m to the southeast (with much of the fill having logically come from dredging for the adjacent seaplane runway). The area around T-035 was developed into a substantial residential subdivision, “Damon Tract” in the early 1950s (see Figure 20).

Documentation Procedures: T-035 was excavated to the coral shelf at 180 cmbs. Shoring was then installed in order to stabilize the walls to allow for documentation.

Stratigraphic Summary: The stratigraphy, presented in Figure 194 and Figure 195, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib), very gravely silty clay fill (Stratum Ic), very gravely silty clay fill (Stratum Id), and very cobbly silty clay fill (Stratum Ie) overlying natural silty clay (Stratum II) to the coral shelf (Stratum III). Stratum Ie consisted of a

redeposited mixture of the underlying natural strata (Stratum II and III). Stratum II appears to be consistent with the USDA soil survey designation of Ewa silty clay loam (EmA).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: A trace (<0.1 g) of marine shell including *Brachidontes crebristriatus* was observed in Stratum II (145-173 cmbs). The small amount of material appears to be naturally-deposited.

Other Lab Results: A bulk sediment sample was collected from Stratum II in order to further characterize the natural sediment. A trace amount of marine shell was collected during wet-screening (see above paragraph for description).

GPR Discussion: A review of amplitude slice maps indicated no linear features, which might indicate the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 25 cmbs.

GPR depth profiles for T-035 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 25 cmbs. An anomaly was observed in the GPR profile but was not observed during excavation. The maximum depth of clean signal return was approximately 80 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-035 consisted of fill (Stratum Ia to Ie) overlying naturally deposited silty clay (Stratum II) to the coral shelf (Stratum III). Stratum Ie consisted of a redeposited mixture of the underlying natural strata (Stratum II and III) and was therefore considered a locally-procured fill deposit. Stratum II appeared to be consistent with the USDA soil survey designation of Ewa silty clay loam (EmA). A bulk sediment sample was collected from Stratum II in order to further characterize the natural sediment. A trace amount of marine shell was identified during wet-screening. No cultural resources were identified.



Figure 193. Photograph of Airport Section, T-035, general location, view to northwest



Figure 194. Photograph of Airport Section, T-035, general view of profile, view to southeast

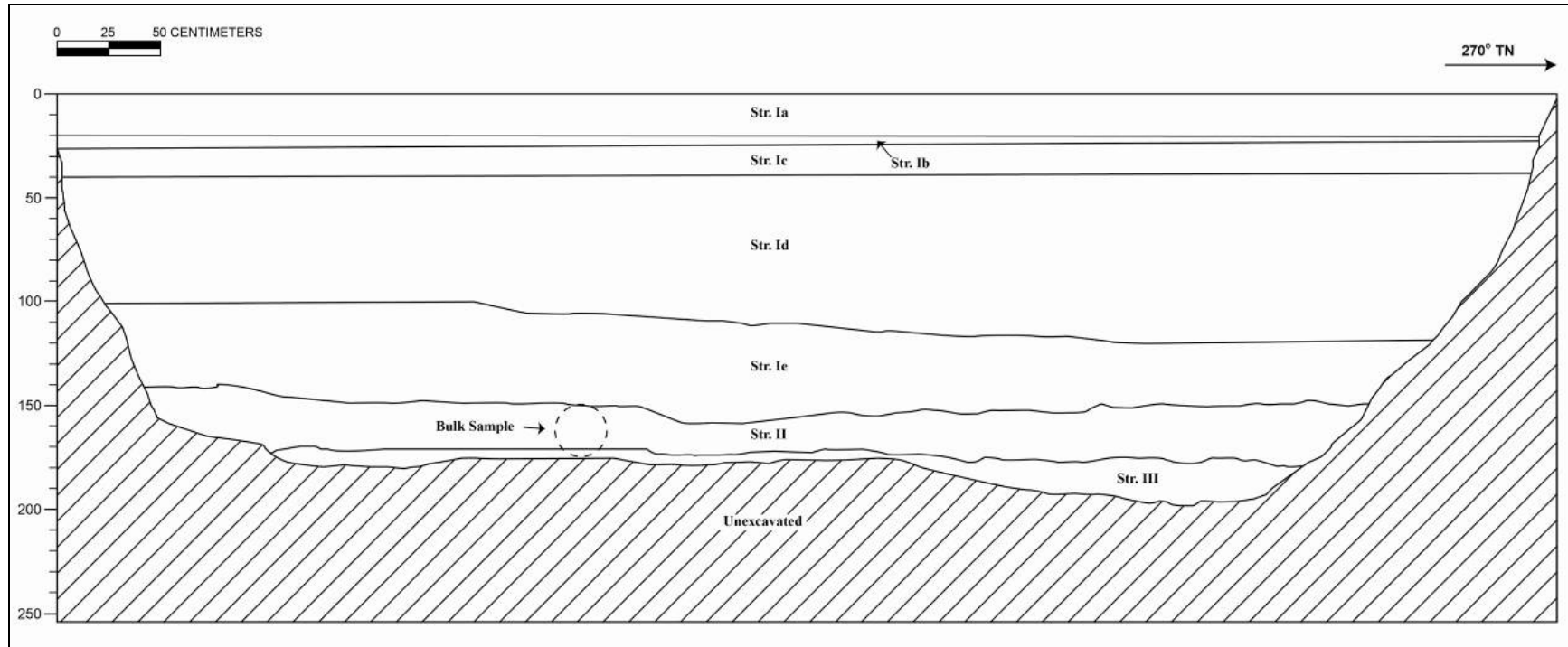


Figure 195. T-035 south profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-25	Asphalt pavement
Ib	20-27	Fill; extremely gravelly silty sand; 10 YR 3/2 (very dark gray brown); single-grain, structureless; moist, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; gravel base course
Ic	25-42	Fill; very gravelly silty clay; 10 YR 3/4 (dark yellow brown); weak, medium, blocky structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; imported fill material deposited to raise grade
Id	37-120	Fill; very gravelly silty clay; 5 YR 3/3 (dark reddish brown); weak, medium, blocky structure; moist, firm consistency; plastic; mixed origin; abrupt, smooth lower boundary; imported fill used to raise surface
Ie	100-157	Fill; very cobbly silty clay; 10 YR 3/3 (dark brown) with mottles (50%, very coarse) of 10 YR 8/1 (white); weak, medium, coarse, blocky structure; moist, firm consistency; plastic; terrigenous origin; abrupt, wavy lower boundary; disturbed, reworked blend of underlying Strata II and III
II	140-180	Natural; silty clay; 10 YR 4/4 (dark yellow brown); massive structure; moist, very firm consistency; non-plastic, A trace (< 0.1 g) of marine shell including <i>Brachidontes crebristriatus</i> was observed; terrigenous origin; lower boundary not visible; natural colluvial deposit (Ewa silty clay loam)
III	168-200	Natural; limestone; 10 YR 8/1 (white); massive structure; very hard, strong consistency; non-plastic; marine origin; lower boundary not visible; coral shelf

7.2.36 Test Excavation 36

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-006: 012-016
Street:	Waiwai Loop
Owner:	Window World, Inc.
Elevation:	2.6 m
UTM:	613965.2562 mE 2359358.286 mN
Max Length/Width/Depth:	7.35 m/0.70 m/2.20 mbs
Orientation:	272/92 TN
Targeted Project Component:	Lagoon Drive Station
USDA Soil Designation:	Ewa silty clay loam (EmA)

Setting: Test Excavation 36 (T-036) was located on the south (*makai*) side of Waiwai Loop in the paved parking lot fronting Window World, Inc. (see Figure 180, Figure 181, and Figure 196).

Summary of Background Research and Land Use: Until the creation of the OR&L railway in the late 1800s (see Figure 12), the area of T-036 was largely underdeveloped even though this test area would have been only a few hundred meters from “Moanalua Bay” to the southeast. By the 1900s, the railway and irrigation improvements furthered development of extensive Honolulu Plantation sugar cane fields, but it appears these fields did not extend as far east as T-036 (see Figure 17). A 1906 map (see Figure 13) indicates that there may have been an area of taro or rice just to the northwest. This may relate to identification of *Oriza*-type (rice) pollen in nearby excavations T-022 and T-033. The 1933 map (see Figure 16) shows a number of houses in this area with Kaloaoa Fishpond and seemingly a couple of smaller related ponds just 250 m to the southwest. The 1943 War Department Aiea quad map (see Figure 19) shows expansive residential and infrastructural development in the immediate area (particularly to the west) associated with military development during the beginning of WWII. This 1943 map documents the relatively rapid land reclamation that occurred with the coastline having been pushed out more than 500 m to the southeast (with much of the fill having logically come from dredging for the adjacent seaplane runway). This T-036 area was developed into a substantial residential subdivision “Damon Tract” in the early 1950s (see Figure 20).

Documentation Procedures: T-036 was excavated to the coral shelf at 205 cmbs.

Stratigraphic Summary: The stratigraphy, presented in Figure 197 and Figure 198, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib), a buried asphalt pavement (Stratum Ic) and associated base course (Stratum Id), clay fill (Stratum Ie), and very gravelly to cobbly loam (Stratum If) overlying natural clay (Stratum II) to the coral shelf (Stratum III). Stratum II appears to conform with the USDA soil survey designation of Ewa silty clay loam (EmA).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: A two-liter bulk sediment was collected from Stratum II in T-036. The sample was wet-screened with no significant results.

GPR Discussion: A review of amplitude slice maps indicated a linear feature, which might indicate the presence of utilities, but this feature was not encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 75 cmbs.

GPR depth profiles for T-036 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 50 cmbs and again around 75 cmbs. An anomaly was observed in the profile but was not encountered while excavating. The maximum depth of clean signal return was approximately 110 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-036 consisted of two successive asphalt layers and associated base courses (Stratum Ia to Id) overlying fill (Stratum Ie and If) and natural clay (Stratum II) to the coral shelf (Stratum III). Stratum II appears to conform with the USDA soil survey designation of Ewa silty clay loam (EmA). A two-liter bulk sediment was collected from Stratum II in T-036. The sample was wet-screened with no significant results. No cultural resources were reported.



Figure 196. Photograph of Airport Section, T-036, general location, view to southeast



Figure 197. Photograph of Airport Section, T-036, general view of profile, view to southwest

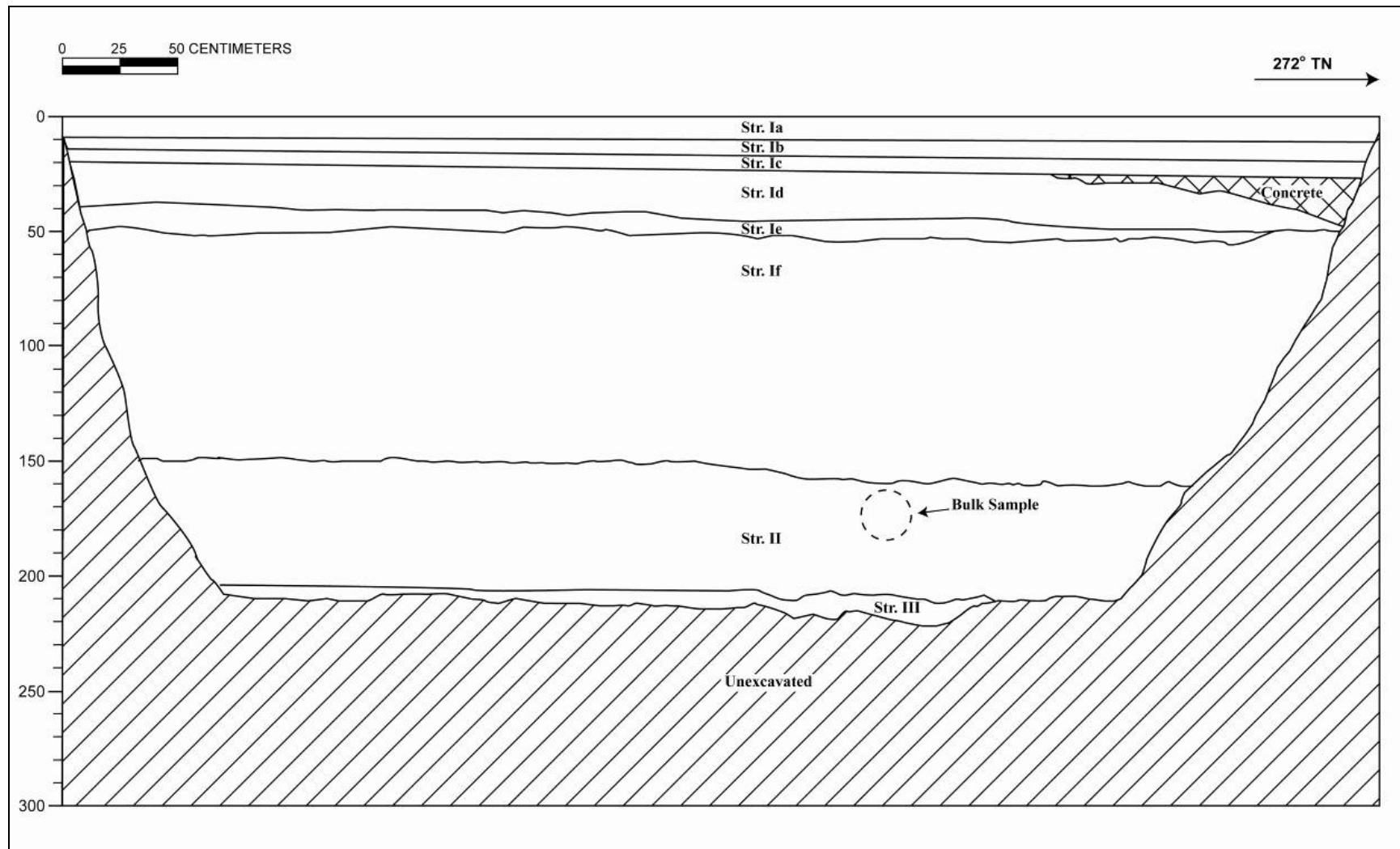


Figure 198. T-036 south profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt
Ib	8-20	Fill, gravel; 10 YR 6/1 (gray); abrupt, smooth lower boundary; gravel base course
Ic	15-25	Asphalt; 5 YR 2/1 (black); older asphalt layer
Id	20-50	Fill; gravel; 10 YR 6/1 (gray); abrupt, smooth lower boundary; many, fine to medium roots; gravel base course
Ie	40-55	Fill; clay; 10 YR 4/4 (dark yellowish brown); moderate, coarse, blocky structure; moist, friable consistency; plastic; terrigenous origin; abrupt, smooth lower boundary; locally procured clay fill material
If	48-160	Fill; very gravelly to cobbly loam; 10 YR 3/4 (dark yellowish brown); single-grain, structureless; moist, very friable consistency; non-plastic; terrigenous origin; very abrupt, smooth lower boundary; few, fine roots
II	150-210	Natural; clay; 10 YR 4/4 (dark yellowish brown); moderate, coarse, blocky structure; moist, friable consistency; terrigenous origin; very abrupt, smooth lower boundary; natural alluvial sediment (Ewa silty clay loam)
III	205-212	Natural; limestone; 10 YR 8/1 (white); massive structure; very hard consistency; marine origin; lower boundary not visible; coral shelf

7.2.37 Test Excavation 37

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-016: 006
Street:	Waiwai Loop
Owner:	Alert Holdings Group, Inc.
Elevation:	2.8 m
UTM:	614156.2492 mE 2359341.335 mN
Max Length/Width/Depth	3.00 m/not recorded/1.32 mbs
Orientation:	156/336 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Ewa silty clay loam (EmA)

Setting: Test Excavation 37 (T-037) was located in a parking lot on the *makai*/Diamond head side of Waiwai Loop where it turns northward (see Figure 199 and Figure 200).

Summary of Background Research and Land Use: T-037 was located on the east end of what was a former spit of land or sandy point extending east into Moanalua Bay (Ke'ehi Lagoon). While no early development (e.g., roads, structures, etc.) is indicated at this specific location, this was an intensively developed traditional cultural landscape with Kaloaloa Pond 500 m to the southwest, and Awaawaloa Fishpond, Ahua Fishpond, and Māpunapuna Fishpond at 200 to 600 m to the northwest (see Figure 22). The confluences of Moanalua Stream, Kahauiki Stream, and Kalihi Stream with the many fishponds, extensive shallows, and the off-shore islet of Mokuoniki would have made this an attractive area. The OR&L railroad initially arced around the inland margins of Ke'ehi Lagoon (see 1899 map, Figure 12), but by 1919 (see Figure 14) a causeway had been developed to carry the rail line straight across the bay approximately 250 m north of T-037. Between 1933 (see Figure 16) and 1943 (see Figure 19), very extensive fill activities pushed the coastline nearly 500 m to the southeast.

Documentation Procedures: Due to the potential for PCB contamination, archaeologists entering the excavation area needed to wear a Tyvek coverall suit and respirator. Utility lines were exposed in the north end of T-037 at 76 cmbs, limiting further excavation. Contamination of sediments prohibited the collection of samples. Excavation ceased at the coral shelf at 132 cmbs.

Stratigraphic Summary: The stratigraphy, presented in Figure 201 and Figure 202, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib) and gravelly cobbly loam fill (Stratum Ic) overlying natural sandy clay loam (Stratum II) to the coral shelf. Stratum II appeared to be consistent with the USDA soil survey designation of Ewa silty clay loam (EmA).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples were collected.

GPR Discussion: A review of amplitude slice maps does not clearly indicate any linear features although a utility was encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 50 cmbs.

GPR depth profiles for T-037 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 40 cmbs. An anomaly was observed in the GPR profile and it corresponds to the utility which was encountered during excavation. The maximum depth of clean signal return was approximately 90 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-037 consisted of asphalt (Stratum Ia) and associated gravel base course (Stratum Ib), gravelly cobbly loam (Stratum Ic), and natural sandy clay loam (Stratum II) overlying the coral shelf. Contamination of sediments prohibited the collection of samples. Stratum II appeared to be consistent with the USDA soil survey designation of Ewa silty clay loam (EmA). No cultural resources were observed.

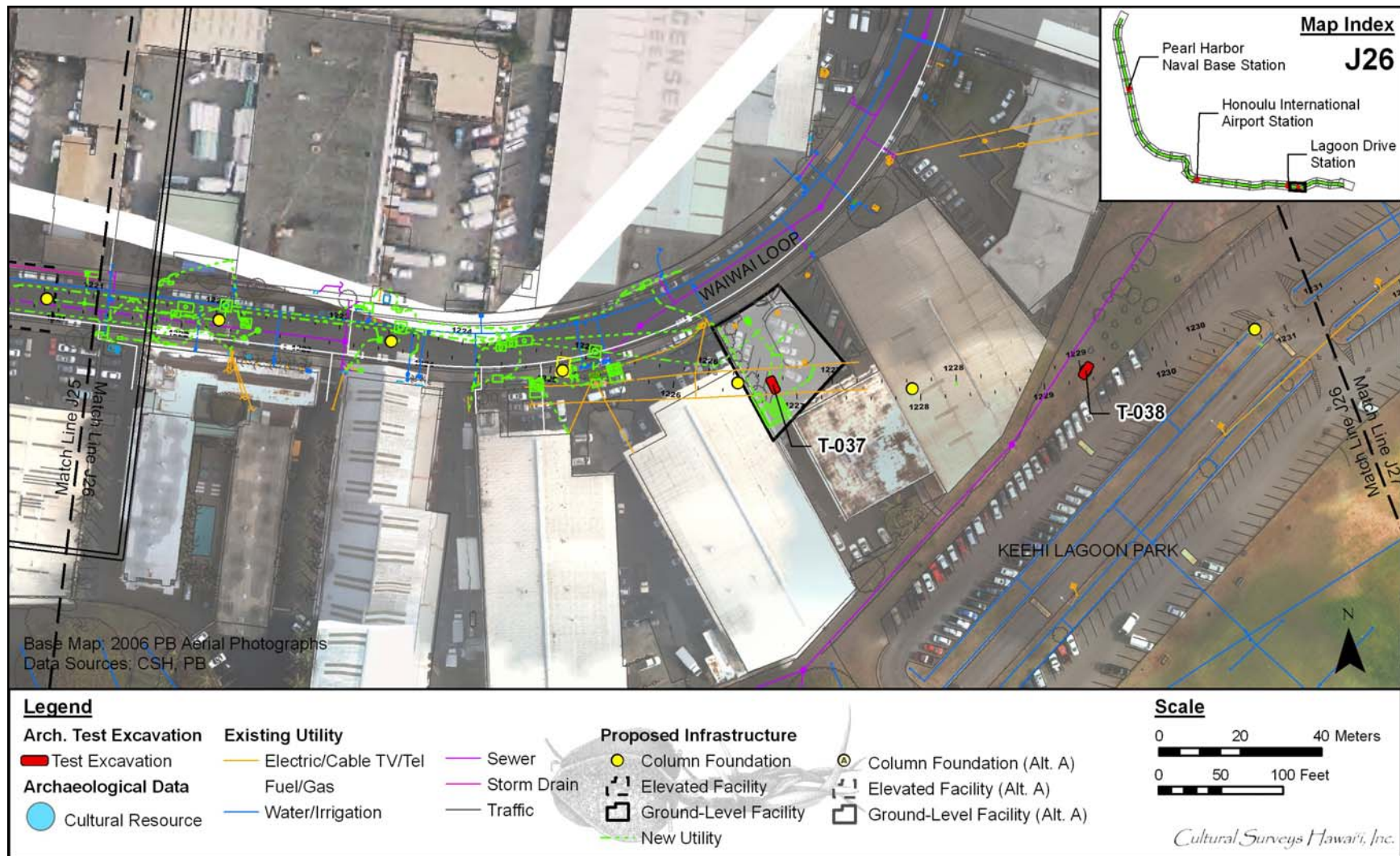


Figure 199. Map Sheet J 26 showing the location of T-037 SE of Waiwai Loop and Test Excavation 38 at Ke'e Lagoon Park



Figure 200. Photograph of Airport Section, T-037, general location, view to southeast



Figure 201. Photograph of Airport Section, T-037, general view of profile, view to ESE

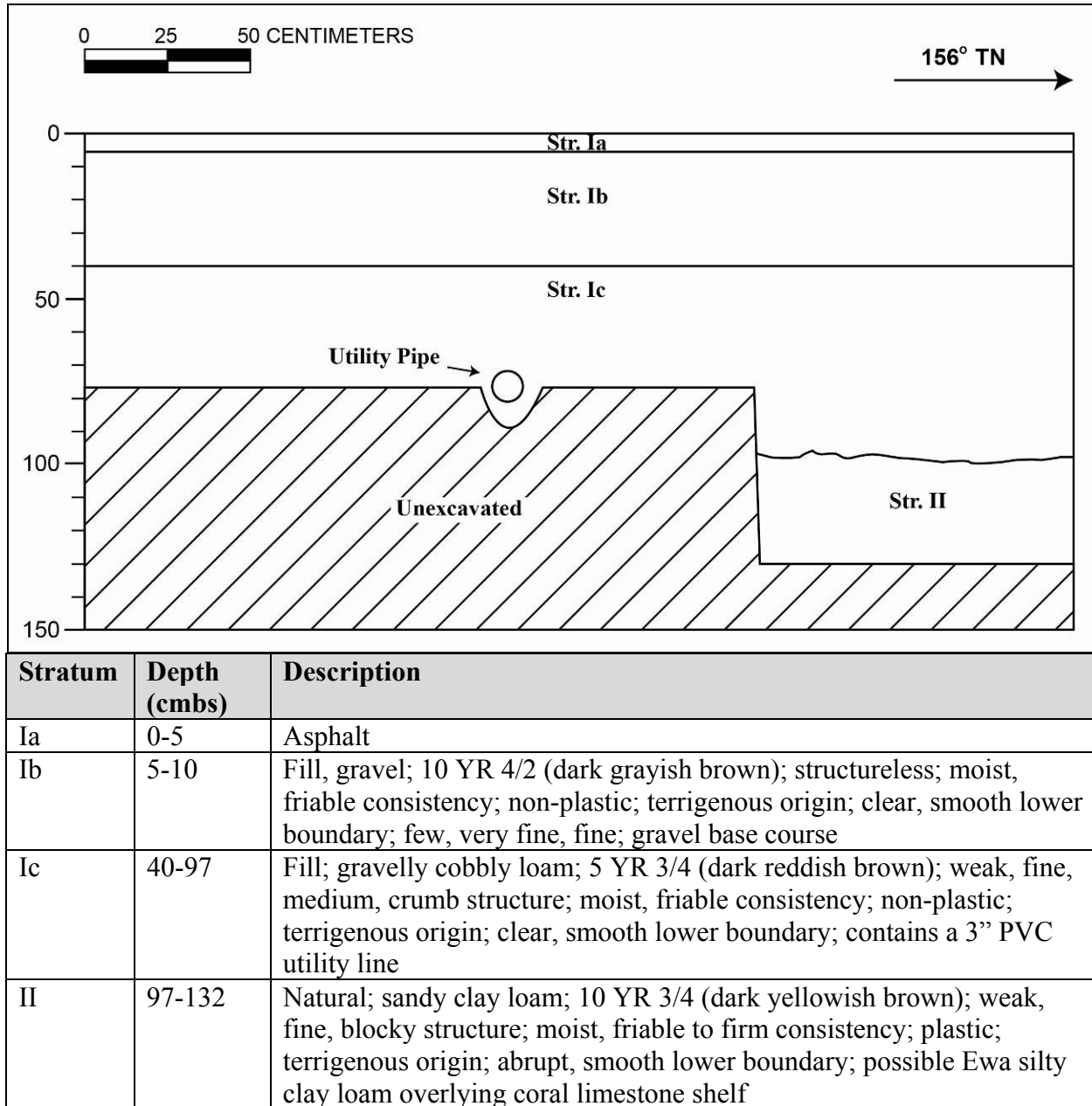


Figure 202. T-037 southwest profile and stratigraphic description

7.2.38 Test Excavation 38

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-003:006
Street:	Ke'ehi Lagoon Park Road
Owner:	State DOT Airports Division
Elevation:	2.7 m
UTM:	614233.2311 mE 2359342.742 mN
Max Length/Width/Depth:	4.10 m/1.05 m/2.70 m
Orientation:	218/38 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 38 (T-038) was located in a grassy area of Ke'ehi Lagoon Park, near the corner where Waiwai Loop turns northward (see Figure 199 and Figure 203). The excavation area is level and low lying.

Summary of Background Research and Land Use: T-038 was located on the east end of what was a former spit of land or sandy point extending east into Moanalua Bay (Ke'ehi Lagoon). While no early development (e.g., roads, structures, etc.) is indicated at this specific location, this was an intensively developed traditional cultural landscape with Kaloaloa Pond 500 m to the southwest, and Awaawaloa Fishpond, Ahua Fishpond, and Māpunapuna Fishpond at 200 to 600 m to the northwest (see Figure 22). The confluences of Moanalua Stream, Kahauiki Stream, and Kalihi Stream with the many fishponds, extensive shallows, and the off-shore islet of Mokuoniki would have made this an attractive area. The OR&L railroad initially arced around the inland margins of Ke'ehi Lagoon (see 1899 map, see Figure 12), but by 1919 (see Figure 14) a causeway had been developed to carry the rail line straight across the bay approximately 250 m north of T-038. Between 1933 (see Figure 16) and 1943 (see Figure 19), very extensive fill activities pushed the coastline nearly 500 m to the southeast.

Documentation Procedures: Excavation was terminated at a depth of 270 cmbs. The water table was at 253 cmbs. Investigation of stratigraphy was performed from inside the trench through an opening in the plywood, reinforced by shoring.

Stratigraphic Summary: The stratigraphy, presented in Figure 204 and Figure 205, consisted of a topsoil O-horizon (Stratum Ia), crushed coral fill (Stratum Ib), and loamy silt fill (Stratum Ic) overlying natural sandy clay (Stratum II). Stratum Ic was considered to be dredge material deposited as land reclamation fill. Stratum II was considered to be marine sandy clay mottled with decomposing vegetation, possibly remnants of marsh sediment. The upper boundary of Stratum II appears to have been disturbed in historic times (due to the presence of historic material).

The stratigraphy generally conforms to the USDA soil survey designation of Fill Land (FL).

Artifacts Discussion: A rusted piece of metal was observed at the upper boundary of Stratum II.

Features Discussion: No features were observed.

Faunal Remains Discussion: A trace (<0.2 g) of marine invertebrate midden including *Brachidontes crebristriatus* bivalvia and *Echinometra mathaei* sea urchin spine was observed in the Stratum Ic fill, from 245-255 cmbs.

A total of 7.6 g of marine gastropod shells (including *Melampus* sp., *Nerita picea*, *Turbo sandwicensis*, *Trochus intextus* and *Hipponix* sp.), 0.8 g of bivalvia (including *Brachidontes crebristriatus* and *Tellina palatum*), a trace (<0.1 g) of *Diadema paucispinum*, and 0.6 g of unidentified fish bone were identified in Stratum II, from 260-270 cmbs. This stratum appears to be enriched with midden; however, rusted metal was also present, so it does not seem to be an in situ midden stratum.

Other Lab Results: Two bulk samples, one each of Strata Ic and II (from approximately 200-260 cmbs), were recovered from the backhoe bucket. An additional sample of Stratum II was obtained from inside the trench. Wet-screening of the Stratum II samples yielded a small amount (1.4 g) of charcoal, 10.4 g of non-midden shell, 0.6 g of fish bone fragments, 144.4 g of wood pieces, and a 13.9 g rusted metal fragment (see above paragraphs for artifact and faunal descriptions). The charcoal sample was not sent for wood taxa identification or radiocarbon analysis as it was not from a discrete feature or a particularly good provenience. Wet-screening of the Stratum Ic sample produced no significant results.

GPR Discussion: A review of amplitude slice maps indicated no linear features, which might indicate the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 50 cmbs.

GPR depth profiles for T-038 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 15 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 100 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-038 consisted of fill (Stratum Ia to Ic) overlying naturally deposited gleyed sandy clay (Stratum II) to the water table at 253 cmbs. The stratigraphy generally conforms to the USDA soil survey designation of Fill Land (FL). Wet-screening of a bulk sample of Stratum II yielded small amounts of charcoal, non-midden shell, fish bone fragments, wood pieces, and a rusted metal fragment.



Figure 203. Photograph of Airport Section, T-038, general location, view to northeast



Figure 204. Photograph of Airport Section, T-038, general view of profile, view to southeast

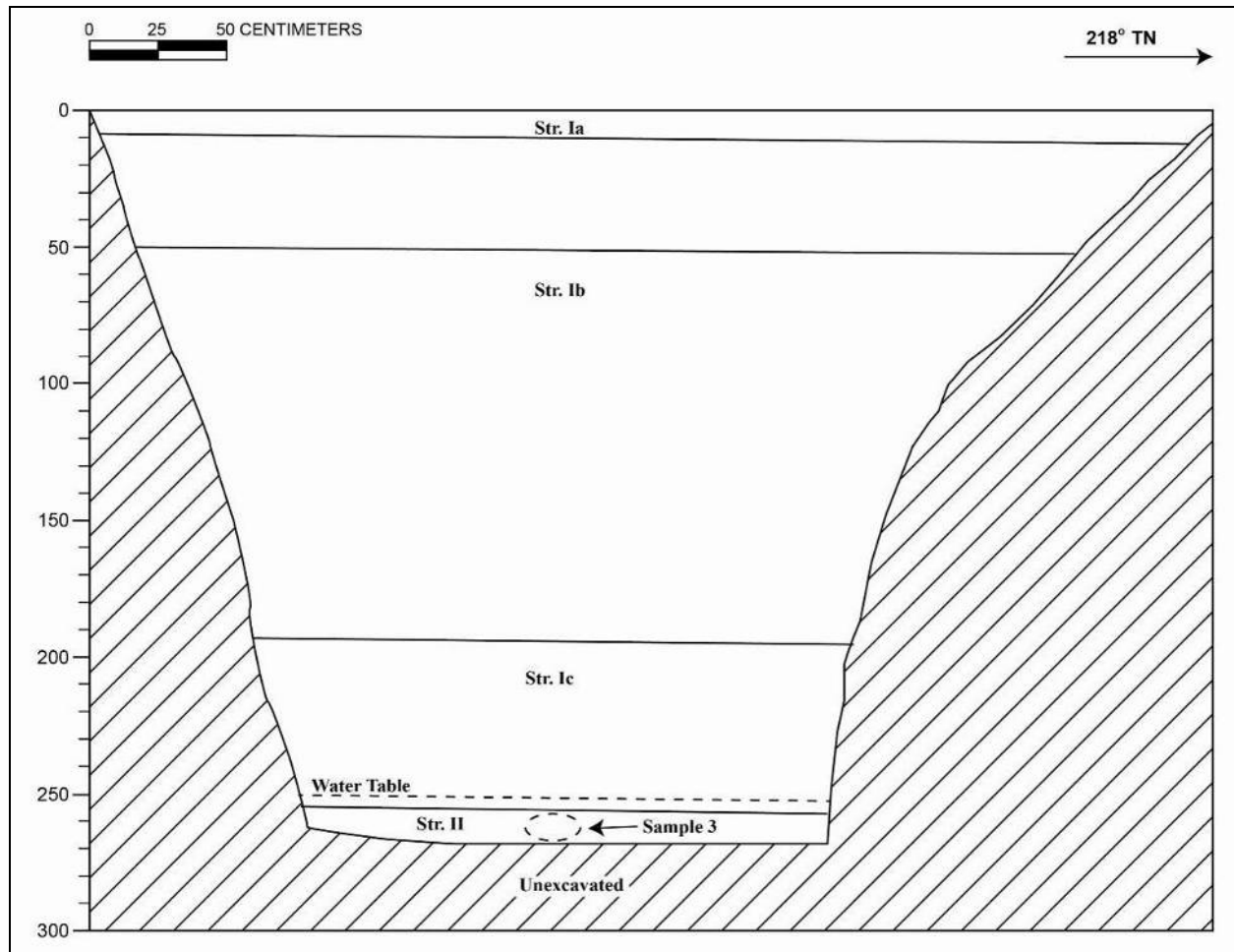


Figure 205. T-038 southeast profile (above) and stratigraphic description (below)

Stratum	Depth (cmts)	Description
Ia	0-9	O-horizon; silt loam; 10 YR 2/4 (dark yellowish brown); weak, fine, crumb structure; moist, very friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; common, very fine to fine roots; topsoil with grass
Ib	9-195	Fill, 10 YR 7/3 (very pale brown); crushed coral; single-grain, structureless; moist, loose consistency; non-plastic; marine origin; very abrupt, smooth lower boundary; few, fine roots; crushed coral land reclamation fill
Ic	195-258	Fill; loamy silt; 2.5 Y 7/2 (light gray); massive structure; moist, friable consistency; slightly plastic; mixed origins, a trace (< 0.2 g) of marine invertebrate midden including <i>Brachidontes crebristriatus</i> bivalvia and <i>Echinometra mathaei</i> sea urchin spine was observed; very abrupt, smooth lower boundary; common, fine roots; pump dredge land reclamation fill with oxidized root remnants
II	258-270	Natural; sandy clay; GLEY 1 6/1 (greenish gray) with mottles (5%, blocks) of 10 YR 3/1 (very dark gray) and (30%, blocks) of 2.5 Y 4/2 (dark grayish brown); massive structure; wet, sticky consistency; plastic; mixed origin; lower boundary not visible; contains some organics (root remnants/wood), charcoal pieces (scattered), marine gastropod shells (including <i>Melampus</i> sp., <i>Nerita picea</i> , <i>Turbo sandwicensis</i> , <i>Trochus intextus</i> and <i>Hipponix</i> sp.) and bivalvia (including <i>Brachidontes crebristriatus</i> and <i>Tellina palatum</i>), a trace of <i>Diadema paucispinum</i> , a trace of unidentified fish bone, coral fragments, an historic wood fragment, and possible cane slag; natural mix of coastal clay with silt loam sediments and sand; evidence of disturbance at the upper boundary indicated by historic inclusions

7.2.39 Test Excavation 39

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-003:006
Street:	Ke'ehi Lagoon Park Road
Owner:	State DOT Airports Division
Elevation:	1.7 m
UTM:	614461.9737 mE 2359446.383 mN
Max Length/Width/Depth:	4.40 m/0.97 m/2.0 m
Orientation:	103/283 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 39 (T-039) was located in the grassy area of Ke'ehi Lagoon Park near the tennis courts, west of Senator Daniel K. Inouye Drive (see Figure 206 and Figure 207). The excavation area is slightly elevated from the parking lot and slightly lower than surrounding areas.

Summary of Background Research and Land Use: T-039 was located on the east end of what was a former spit of land or sandy point extending east into Moanalua Bay (Ke'ehi Lagoon). While no early development (e.g., roads, structures, etc.) is indicated at this specific location, this was an intensively developed traditional cultural landscape with Kaloaloa Pond 500 m to the southwest, and Awaawaloa Fishpond, Ahua Fishpond, and Māpunapuna Fishpond at 200 to 600 m to the northwest (see Figure 22). The confluences of Moanalua Stream, Kahauiki Stream, and Kalihi Stream with the many fishponds, extensive shallows, and the off-shore islet of Mokuoniki would have made this an attractive area. The OR&L railroad initially arced around the inland margins of Ke'ehi Lagoon (see 1899 map, see Figure 12), but by 1919 (see Figure 14) a causeway had been developed to carry the rail line straight across the bay approximately 250 m north of T-039. Between 1933 (see Figure 16) and 1943 (see Figure 19), very extensive fill activities pushed the coastline nearly 500 m to the southeast.

Documentation Procedures: T-039 was excavated to 200 cmbs (just below the water table). Plywood for the shoring system restricted visibility of the walls (north and south). Archaeologists stayed within the shored zone and reached outside of the system to clean and examine sidewalls with a trowel.

Stratigraphic Summary: The stratigraphy, presented in Figure 208 and Figure 209, consisted of silty loam fill (Stratum Ia), silty clay loam fill, and crushed coral fill (Stratum Ic) overlying natural silty clay (Stratum IIa and IIb). The stratigraphy generally conformed to the USDA soil survey designation of Fill Land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: A trace (<0.1 g) of *Brachidontes crebristriatus* and a 1.5 gram fish vertebra were collected from a sample taken at the interface of Stratum IIa and IIb (from 167-187 cmbs).

Other Lab Results: A bulk sediment sample was collected from the interface of Stratum IIa and IIb (from 167-187 cmbs) in order to further characterize the nature of the sediment. Wet-screening yielded trace amounts (<0.1 g) of non-midden shell and wood pieces and a 1.5 g fish vertebra (see above paragraph for faunal descriptions). Laboratory analysis concluded that the strata are natural, based on comparison to natural sediments from other excavations in the area.

GPR Discussion: A review of amplitude slice maps indicated a linear feature, which might indicate the presence of utilities, but was not within the excavation area. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 25 cmbs.

GPR depth profiles for T-039 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 20-25 cmbs and again around 90 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 110 cmbs (see Appendix E for more details).

Summary: Stratigraphy within T-039 consisted of fill (Stratum Ia-Ic) overlying natural silty clay (Stratum IIa and IIb) to the water table. T-039 was excavated to 200 cmbs (just below the water table at 195 cmbs). A bulk sediment sample was collected from the interface of Stratum IIa and IIb (from 167-187 cmbs) in order to further characterize the nature of the sediment. Wet-screening yielded trace amounts (<0.1 g) of non-midden shell and wood pieces and a 1.5 g fish vertebra. No cultural resources were identified.

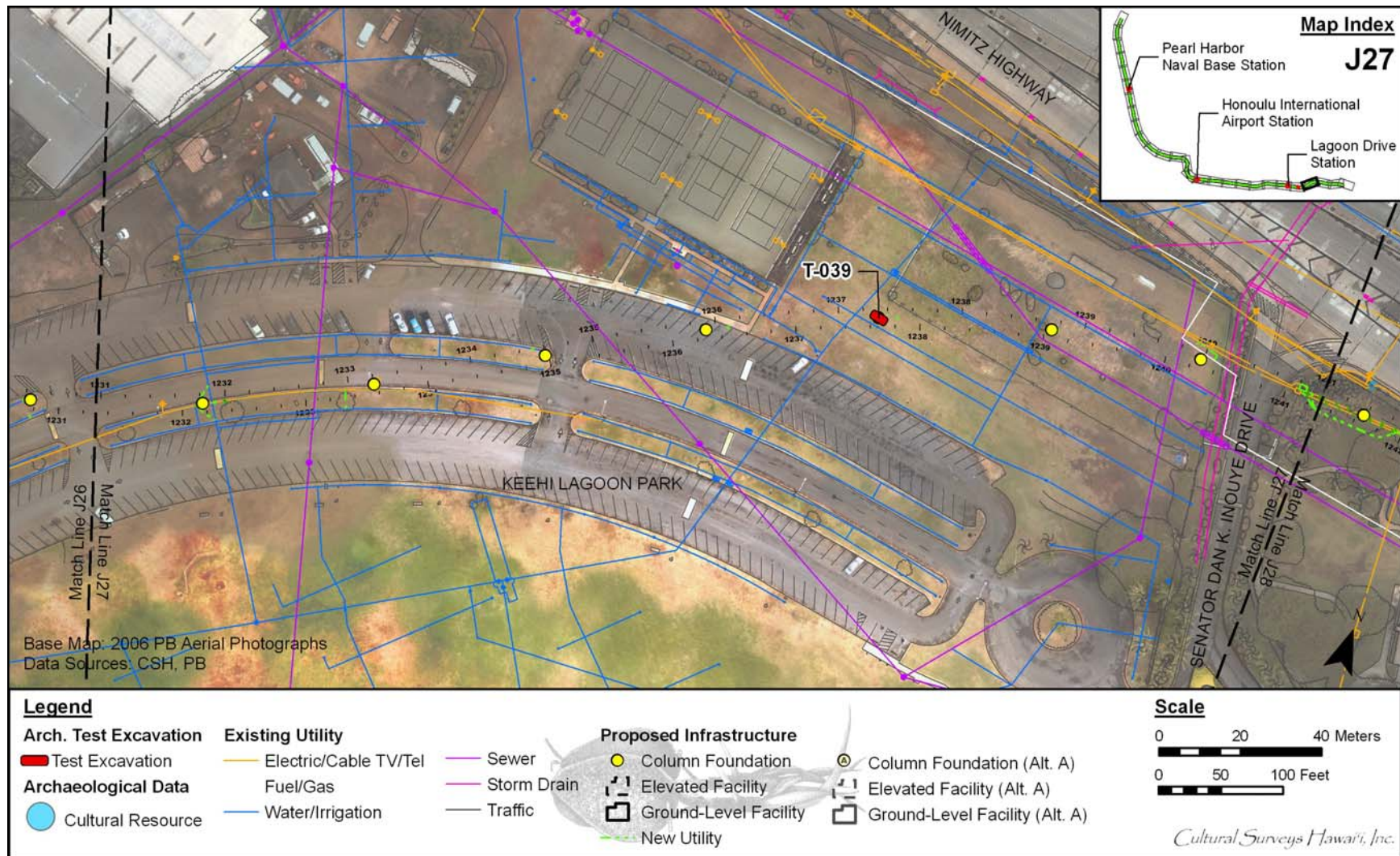


Figure 206. Map Sheet J 27 showing the location of T-039 at Ke'ehi Lagoon Park



Figure 207. Photograph of Airport Section, T-039, general location, view to north



Figure 208. Photograph of Airport Section, T-039, general view of profile, view to northwest

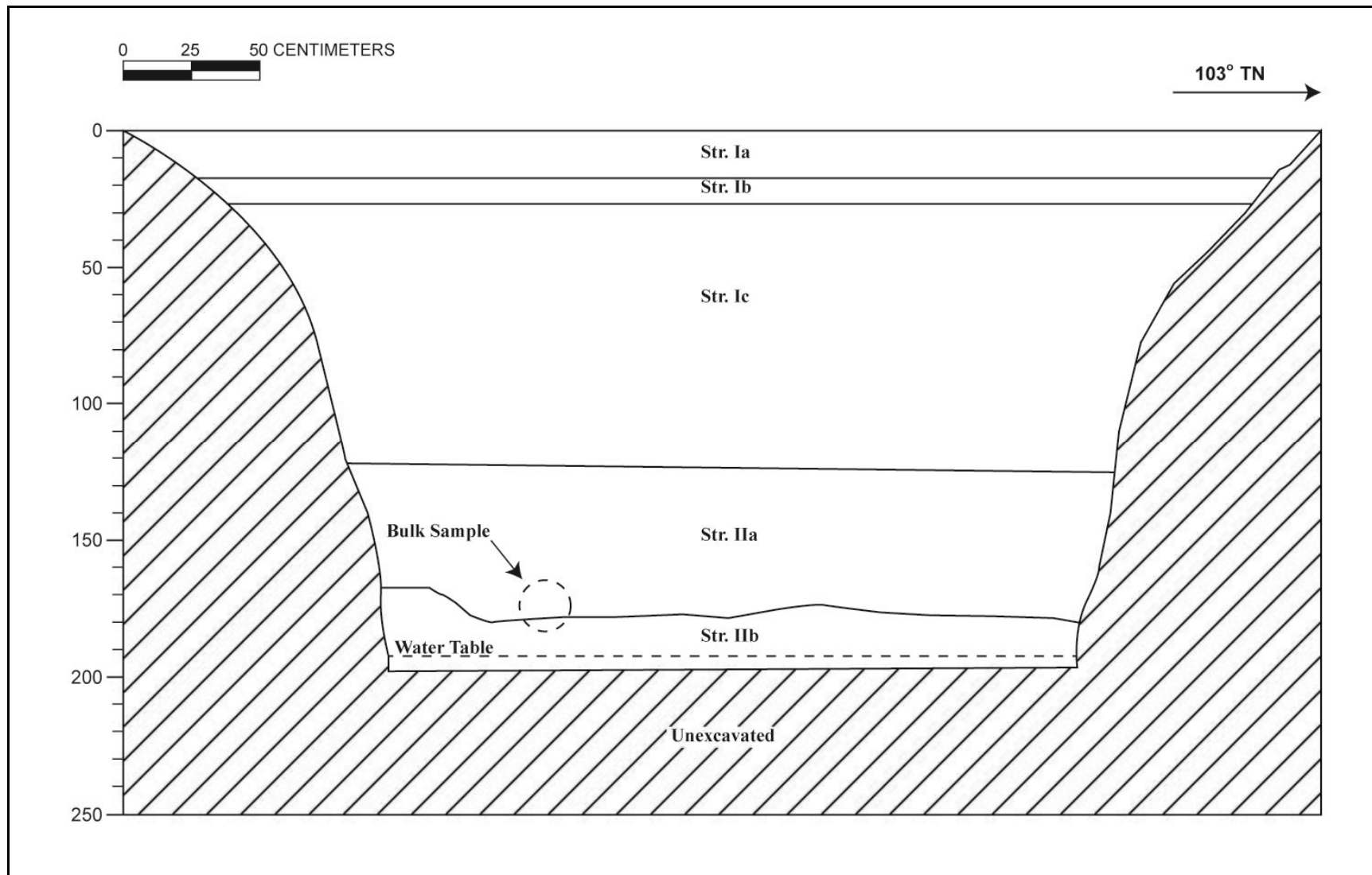


Figure 209. T-039 southeast profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-17	Fill; silty loam; 5 YR 3/4 (dark reddish brown); weak, fine to medium, blocky structure; moist, friable consistency; slightly plastic; mixed origin; abrupt, smooth lower boundary; common, fine roots; topsoil
Ib	17-27	Fill, silty clay loam; 7.5 YR 5/1 (gray); weak, fine, blocky structure; moist, friable consistency; slightly plastic; abrupt, smooth lower boundary; common, fine roots; more gravelly towards the eastern portion of the trench
Ic	27-128	Fill; very gravelly sandy loam; 10 YR 8/2 (very pale brown); single-grain, structureless; moist, loose consistency; mixed origin; abrupt, smooth lower boundary; crushed coral
IIa	128-180	Natural; silty clay; 10 YR 4/1 (dark gray); massive structure; moist, firm consistency; plastic; mixed origin; abrupt, smooth lower boundary; contains decaying wood
IIb	160-200	Natural; silty clay; GLEY 1 6/10 Y (greenish gray); massive structure; wet, sticky consistency; plastic; a trace (< 0.1 g) of <i>Brachidontes crebristriatus</i> and a 1.5 gram fish vertebrae were observed; mixed origin; lower boundary not visible; contains sand in west corner of stratum

7.2.40 Test Excavation 40

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-003
Street:	Nimitz Highway
Owner:	State DOT
Elevation:	0.8 m
UTM:	615009.0762 mE 2359421.907 mN
Max Length/Width/Depth:	3.50 m/1.10 m/0.45 m
Orientation:	290/110 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 40 (T-040) was located in the grassy median between Nimitz and Kamehameha Highways (see Figure 210 and Figure 211). The excavation area is level with the surrounding land surface.

Summary of Background Research and Land Use: It seems pretty clear that as late as 1933 (see Figure 16), the vicinity of T-040 was in the shallow waters of Ke'ehi Lagoon. By 1942/1943, this area appears to have still been a low-lying coastal wetland (see Figure 19). By 1953 (see Figure 20), this area appears to have been filled in.

Documentation Procedures: Results were consistent with the vicinity having formerly been in the waters (ocean/channel) of Ke'ehi Lagoon until it was filled between 1943 and 1953 (according to historic maps).

Stratigraphic Summary: The stratigraphy, presented in Figure 212 and Figure 213, consisted of grading fill (Stratum Ia and Ib) to beneath the water table. This was consistent with documentation in historic maps that the immediate vicinity of T-040 was in shallow seas until filled in between 1943 and 1953. The stratigraphy also conforms to the USDA soil survey designation of Fill Land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps indicated no linear features, which might indicate the presence of utilities. Reflectivity was not uniform throughout the grid and increased around 75 cmbs, but excavation ceased around 40 cmbs due to the presence of the water table. A transition from higher reflectivity to lower reflectivity was observed at approximately 50 cmbs and increased again around 75 cmbs.

GPR depth profiles for T-040 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 150 cmbs (see Appendix E for more details).

Summary: The stratigraphy is fill (Stratum Ia and Ib) to the water table, which is consistent with historic maps that documented the location of T-040 in shallow seas until being filled between 1943 and 1953. The stratigraphy also conforms to the USDA soil survey designation of Fill Land (FL). The water table was recorded at 38 cmbs. No cultural resources were identified.

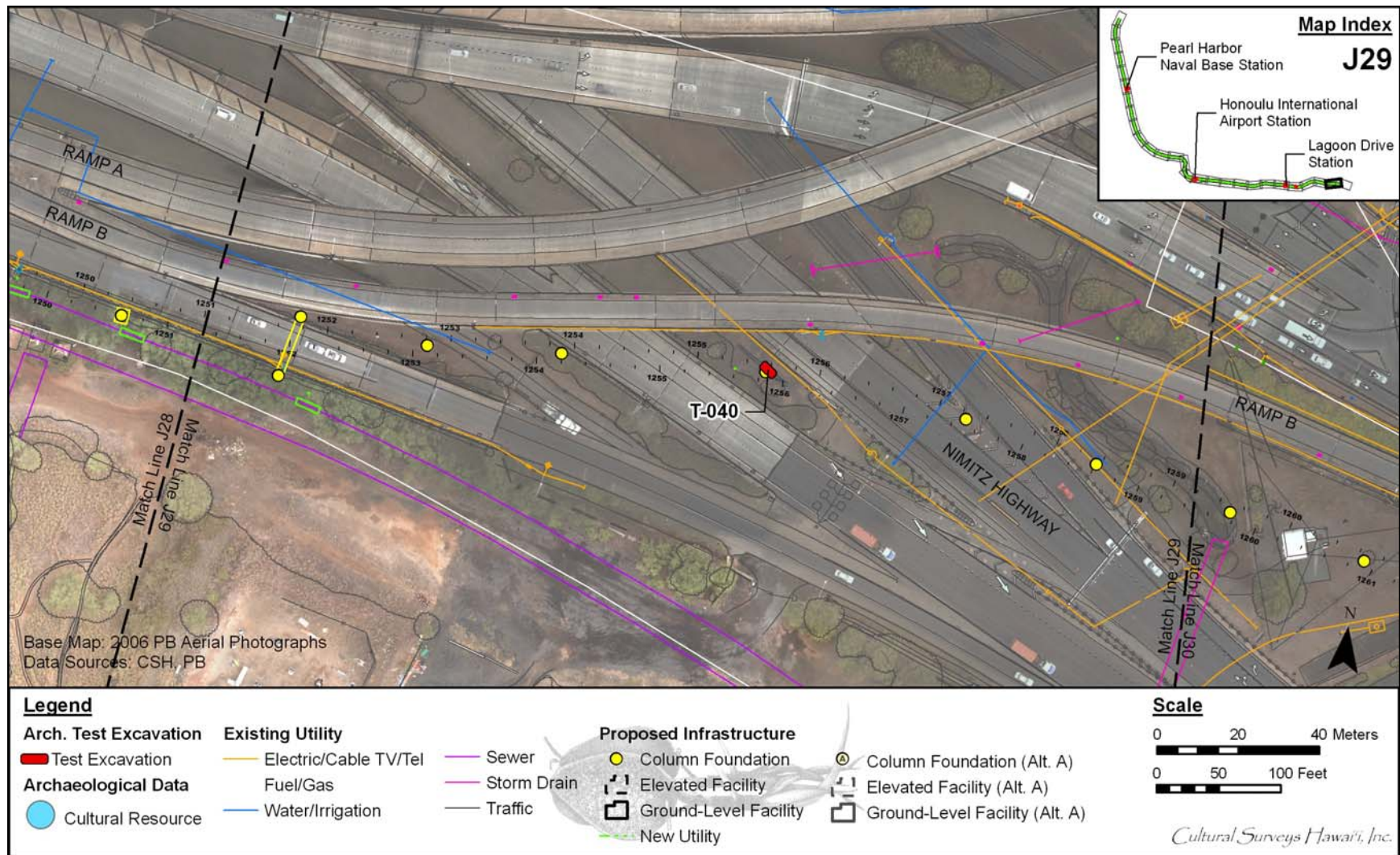


Figure 210. Map Sheet J 29 showing the location of T-040 at Nimitz/Kamehameha Highway/Middle Street interchange



Figure 211. Photograph of Airport Section, T-040, general location, view to northwest



Figure 212. Photograph of Airport Section, T-040, general view of profile, view to west

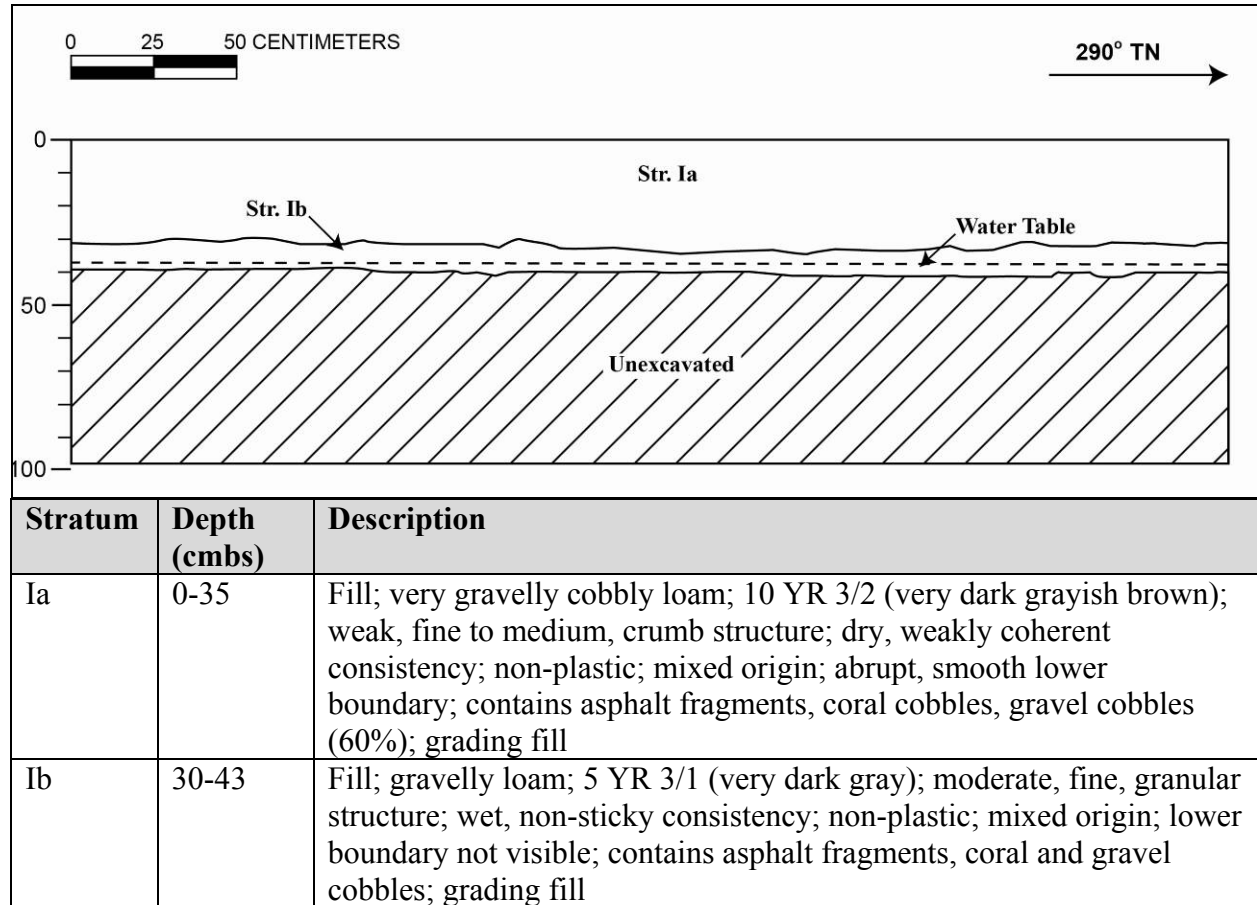


Figure 213. T-040 northwest profile and stratigraphic description

7.2.41 Test Excavation 41

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-003
Street:	Ala Onaona Street
Owner:	State DOT Airports Division
Elevation:	5.0 m
UTM:	611780.7602 mE 2359500.894 mN
Max Length/Width/Depth:	3.0 m/0.90 m/2.3 m
Orientation:	170/350 TN
Targeted Project Component:	Column foundation
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 41 (T-041) was located in the *makai* parking lot of the airport *lei* shops (see Figure 138 and Figure 214). The excavation area is level with the surrounding parking lot surface.

Summary of Background Research and Land Use: Until the creation of the OR&L railway in the late 1800s (see Figure 12), the area was largely underdeveloped pasture land. By the 1900s, the railway and irrigation improvements furthered development of extensive Honolulu Plantation sugar cane fields. T-041 appears to be located within former sugar cane “Field 9” of the Honolulu Plantation (see Figure 17). The 1943 War Department Aiea quad map (Figure 19) shows the first signs of other development in the area, residential and infrastructural development associated with the military reservation south (*makai*) of T-041.

Documentation Procedures: T-041 was excavated to basalt bedrock at 230 cmbs.

Stratigraphic Summary: The stratigraphy, presented in Figure 215 and Figure 216, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib), crushed coral fill (Stratum Ic), gravelly sandy loam fill (Stratum Id), and very gravelly silty sand fill (Stratum Ie) overlying natural clay (Stratum II) to basalt bedrock (Stratum III). The stratigraphy generally conforms to the USDA soil survey designation of Fill Land (FL). Imported fill events were observed to a depth of 107 cmbs. Bedrock was encountered at 230 cmbs.

Artifacts Discussion: Several artifacts were collected:

- 1) A broken glass bottle neck was collected from spoil associated with Stratum Id (see Figure 244).
- 2) One iron nail was collected from spoil associated with Stratum Id (see Figure 244).
- 3) One (mostly intact) Coca Cola bottle was collected from Stratum II from approximately 140 cmbs. Possibly indicated the Stratum was culturally deposited instead of naturally occurring. This Coca-Cola bottle is believed to have been manufactured in 1942 outside of the Territory of Hawaii (see Artifact Analysis Section 8.1 and Figure 243)

4) Five rusted metal fragments were recovered from Stratum II between 138 and 143 cmbs.

Features Discussion: No features were observed.

Faunal Remains Discussion: A total of 1.5 g of marine shell midden including *Turbo sandwicensis* and *Brachidontes crebristriatus* were collected from Stratum II (138-143 cmbs).

Other Lab Results: One bulk sample and one field-screened sample were collected.

A bulk sample was collected from Stratum II at 138-143 cmbs in order to further characterize the nature of the sediment. Wet-screening yielded several waterworn basalt gravels, 1 clear glass fragment, and two small metal pieces.

A 10-liter sample was collected from Stratum II at a depth of 140 cmbs and screened through a 1/8-inch screen in the field. Screening produced three small rusted metal pieces, 1.5 g of non-midden shell, and several small pieces of charcoal (0.5 g). The sample was collected in order to further characterize the nature of the sediment and because charcoal was present. The charcoal sample was not sent for wood taxa identification or radiocarbon analysis as it was not from a discrete feature or a particularly good provenience.

GPR Discussion: A review of amplitude slice maps indicated no linear features, which might indicate the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 50 cmbs.

GPR depth profiles for T-041 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 15 cmbs and again around 60 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 130 cmbs (see Appendix E for more details).

Summary: The stratigraphy was fill (Stratum Ia to Ie) overlying naturally deposited clay (Stratum II) to basalt bedrock (Stratum III). The stratigraphy generally conforms to the USDA soil survey designation of Fill Land (FL). Imported fill events were observed to a depth of 107 cmbs. Bedrock was encountered at 230 cmbs. A 1942 Coca Cola bottle collected from Stratum II indicates that the overlying fill layers post-date 1941 and also show intrusions into the naturally deposited sediments (Stratum II) prior to the fill episodes. The excavation results of T-041 are significant in that they supply a complete stratigraphic profile to bedrock, whereas several test excavations in the vicinity (T-023, T-024, T-025, and T-026) ended at a relatively shallow concrete slab. T-041 also provides clear evidence that the fill deposits in the vicinity post-date 1941.



Figure 214. Photograph of Airport Section, T-041, general location, view to east



Figure 215. Photograph of Airport Section, T-041, general view of profile, view to northwest

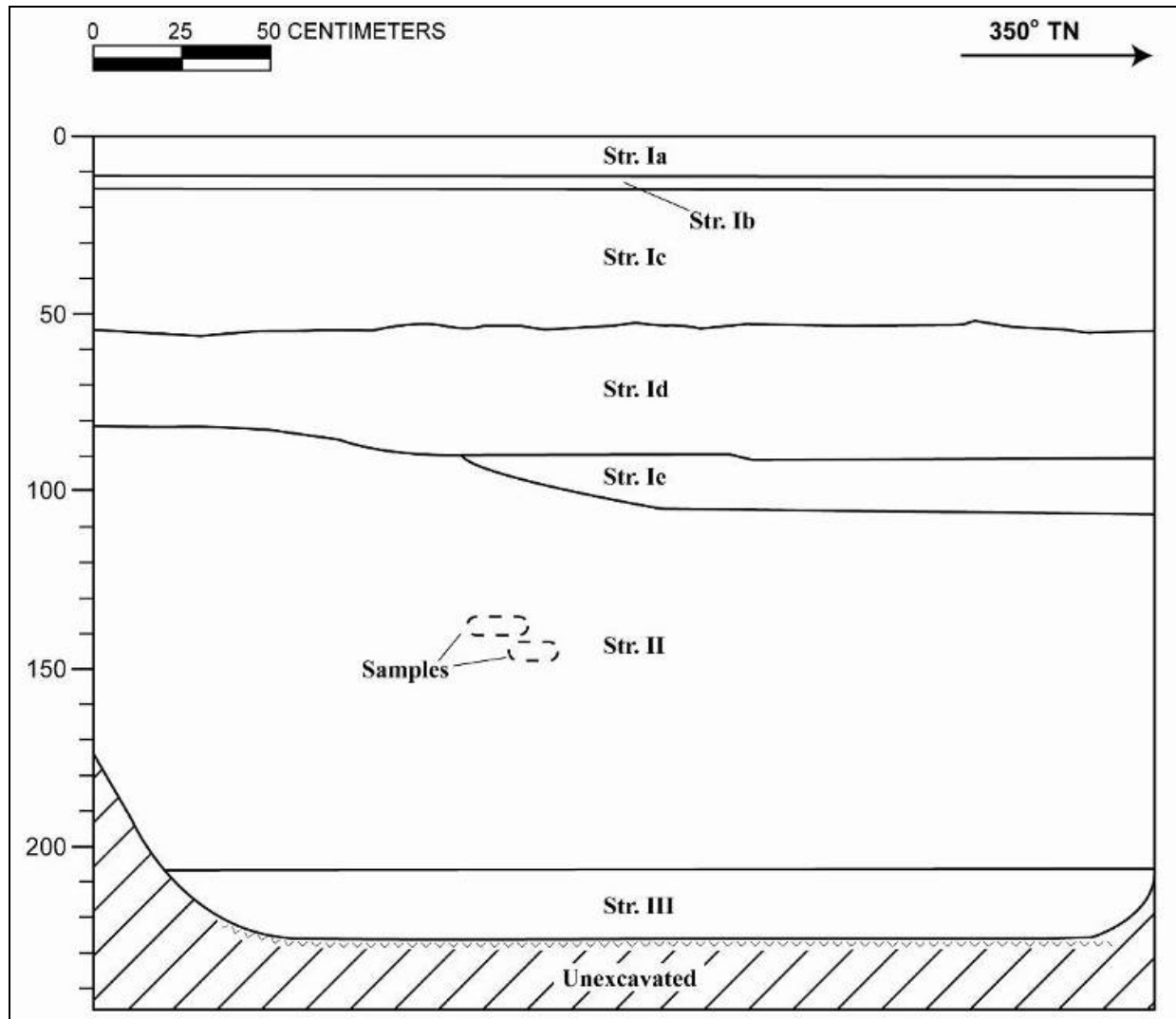


Figure 216. T-041 west profile (above) and stratigraphic description (below)

Stratum	Depth (cmbs)	Description
Ia	0-13	Asphalt
Ib	13-16	Fill; base course; 7.5YR 4/2 (brown)
Ic	16-58	Fill; extremely gravelly sand; 10YR 6/3 (pale brown); single-grain, structureless; moist, loose consistency; non-plastic; marine origin; abrupt lower boundary; crushed coral
Id	58-94	Fill; gravelly sandy loam; 10YR 3/4 (dark yellowish brown); weak, fine crumb structure; moist, friable consistency; slightly plastic; mixed origin; abrupt, smooth lower boundary; contains glass bottle neck, nail; imported fill with subangular basalt
Ie	94-107	Fill; very gravelly silty sand; 10YR 5/2 (grayish brown); weak, fine crumb structure; moist, very friable consistency; abrupt, broken/discontinuous lower boundary
II	107-210	Natural; clay; 10YR 4/3 (brown); blocky structure; moist, very friable consistency; plastic, marine shell including <i>Turbo sandwicensis</i> and <i>Brachidontes crebristriatus</i> were observed in Stratum II (138-143 cmbs).; terrigenous origin; lower boundary not observed; contains charcoal, slag, metal, glass, Coca-Cola bottle, concrete; locally procured fill
III	210-230	Natural; basalt; 10YR 6/5 (brownish yellow); massive structure; moist, strong consistency; non-plastic; lower boundary not visible; decomposing bedrock

7.2.42 Test Excavation 42

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002:001
Street:	Ala Onaona Street (<i>makai</i> or south of the street)
Owner:	State DOT Airports Division
Elevation:	6.0 m
UTM:	611885.1849 mE 2359484.58 mN
Max Length/Width/Depth:	3.60 m/0.90 m/1.85 m
Orientation:	16/196 TN
Targeted Project Component:	Honolulu International Airport Station
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 42 (T-042) was located at the alternate (southern) station footprint in the airport parking lot at the corner of Ala Onaona Street and Ala Auana Street, near Ala Auana Street (see Figure 217 and Figure 218). The excavation area was level with the surrounding surface.

Summary of Background Research and Land Use: Until the creation of the OR&L railway in the late 1800s (Figure 12), the area around T-042 was largely underdeveloped pasture land. By the 1900s, the railway and irrigation improvements furthered development—particularly of Honolulu Plantation sugar cane fields. T-042 appears to be located within former sugar cane “Field 9” of the Honolulu Plantation (see Figure 17). There appears to have been a Honolulu Plantation railroad line in this immediate area running roughly parallel to, and approximately 400 m to the south of, the OR&L line. The 1933 map (see Figure 16) shows virtually no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (see Figure 19), however, shows a burst of recent residential and infrastructural development in the immediate area associated with military development during the beginning of WWII.

Documentation Procedures: T-042 was excavated until encountering a concrete slab at 181 cmbs.

Stratigraphic Summary: The stratigraphy, presented in Figure 219 and Figure 220, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib), crushed coral fill (Stratum Ic), and very gravelly cobbly loamy sand (Stratum Id) overlying a buried concrete slab at 181 cmbs. The stratigraphy conforms to the USDA soil survey designation of Fill Land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps indicated no linear features, which might indicate the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 50 cmbs and increased again around 75 cmbs.

GPR depth profiles for T-042 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 25-30 cmbs and again around 60 cmbs. No utilities were observed in the GPR profile. The maximum depth of clean signal return was approximately 150 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-042 consisted of asphalt (Stratum Ia) and fill (Stratum Ib-Id) above a concrete slab located at the base of excavation (181 cmbs). The thickness of the concrete slab prohibited further excavation. The buried concrete slab that was identified in T-042 has been designated a component of SIHP# 50-80-13-7421 Feature 2 (see Section 7.4.3).

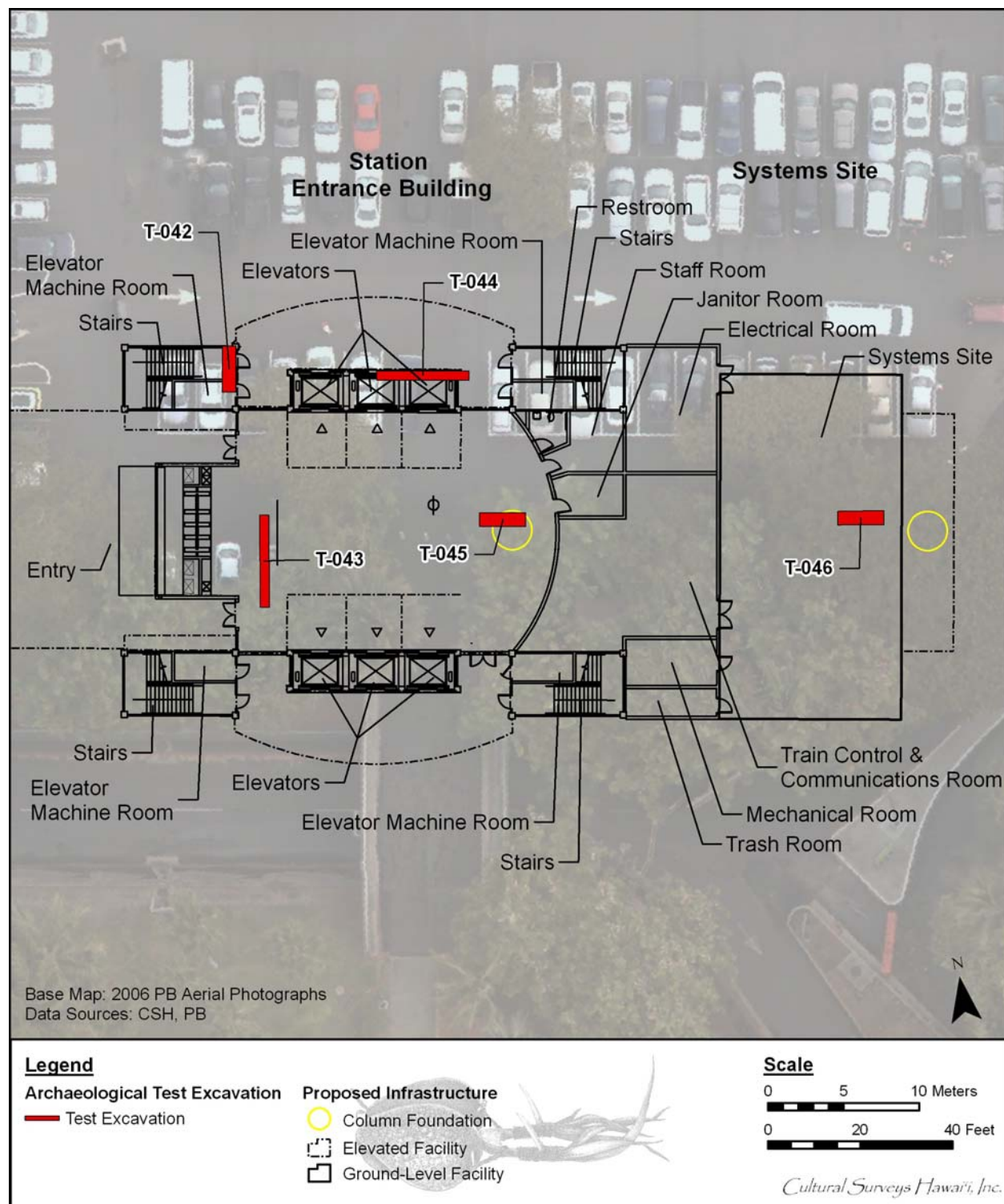


Figure 217. Honolulu International Airport Station overview of Test Excavations at the Alternate (southern) station footprint showing the location of T-042 to T-046



Figure 218. Photograph of Airport Section, T-042, general location, view to north



Figure 219. Photograph of Airport Section, T-042, general view of profile, view to southeast

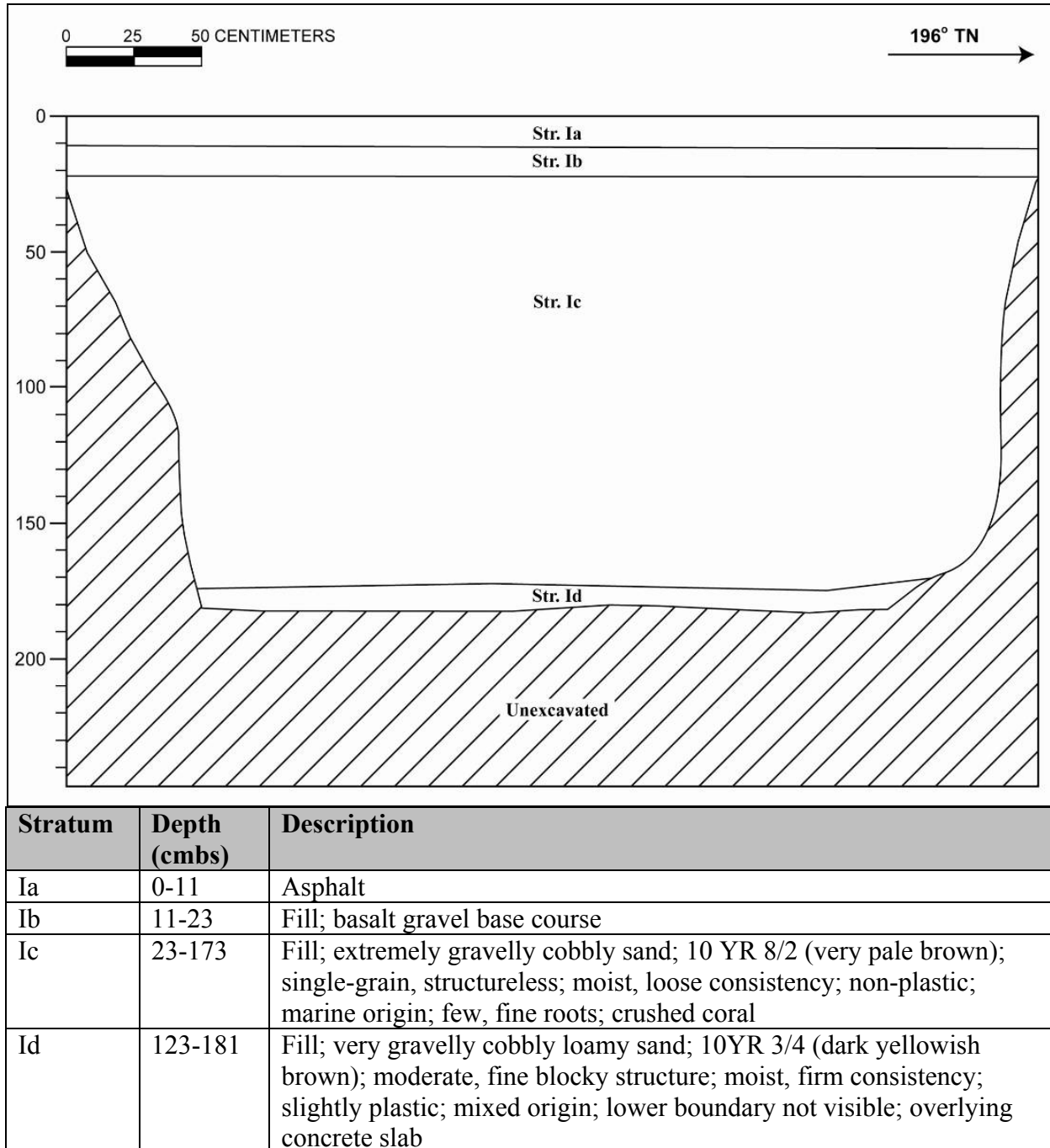


Figure 220. T-042 southeast profile and stratigraphic description

7.2.43 Test Excavation 43

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002:001
Street:	Ala Onaona Street (<i>makai</i> or south of the street)
Owner:	State DOT Airports Division
Elevation:	6.0 m
UTM:	611885.5707 mE 2359471.665 mN
Max Length/Width/Depth:	6.70 m/0.72 m/3.05 m
Orientation:	10/190 TN
Targeted Project Component:	Honolulu International Airport Station
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 43 (T-043) was located at the alternate (southern) station footprint within a parking lot on Ala Onaona Street, on the Diamond Head side (see Figure 217 and Figure 221). The excavation area is slightly elevated from the surrounding surface, with a slight decline to the north.

Summary of Background Research and Land Use: Until the creation of the OR&L railway in the late 1800s (see Figure 12), the area around T-043 was largely underdeveloped pasture land. By the 1900s, the railway and irrigation improvements furthered development, particularly of Honolulu Plantation sugar cane fields. T-043 appears to be located within former sugar cane "Field 9" of the Honolulu Plantation (see Figure 17). There appears to have been a Honolulu Plantation railroad line in the immediate area running roughly parallel to, and approximately 400 m to the south of, the OR&L line. The 1933 map (see Figure 16) shows no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (see Figure 19), however, shows expansive residential and infrastructural development in the immediate area associated with military development during the beginning of WWII.

Documentation Procedures: A concrete jacket was encountered in the south end of T-043 at 56 cmbs, limiting excavation. Excavation was continued to 290 cmbs when shoring was installed. The archaeologists entered T-043 within the shoring system and continued to hand-excavate a small area to 305 cmbs.

Stratigraphic Summary: The stratigraphy, presented in Figure 222 and Figure 223, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib), very gravelly silt loam fill (Stratum Ic), very gravelly cobbly sandy loam fill (Stratum Id), loam fill (Stratum Ie), and very gravelly sandy clay fill (Stratum If). The stratigraphy conforms to the USDA soil survey designation of Fill Land (FL) No natural sediment was encountered.

Artifacts Discussion: Clear glass bottle fragments (non-diagnostic) were observed in Stratum If between 285 and 305 cmbs.

Features Discussion: No features were observed.

Faunal Remains Discussion: A total of 11.0 g of marine shell including *Cerithium* sp., *Turbo sandwicensis*, and *Trochus intextus* was recovered from Stratum If (285-305 cmbs).

Other Lab Results: One sample from Stratum If at 285-305 cmbs was collected via shovel (hand collected) for wet-screening in order to further characterize the nature of the sediment. Wet screening yielded one clear glass fragment and 11.0 g of marine shell (see above paragraph for faunal description).

GPR Discussion: A review of amplitude slice maps indicated no linear features, which might indicate the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 50 cmbs.

GPR depth profiles for T-043 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 20-25 cmbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 90 cmbs (see Appendix E for more details).

Summary: Stratigraphy observed within T-043 consisted of asphalt (Stratum Ia) overlying fill (Stratum Ib-If) to the base of excavation at 305 cmbs. The coral shelf was not encountered. No cultural resources were identified.



Figure 221. Photograph of Airport Section, T-043, general location, view to northwest



Figure 222. Photograph of Airport Section, T-043, general view of profile, view to northeast

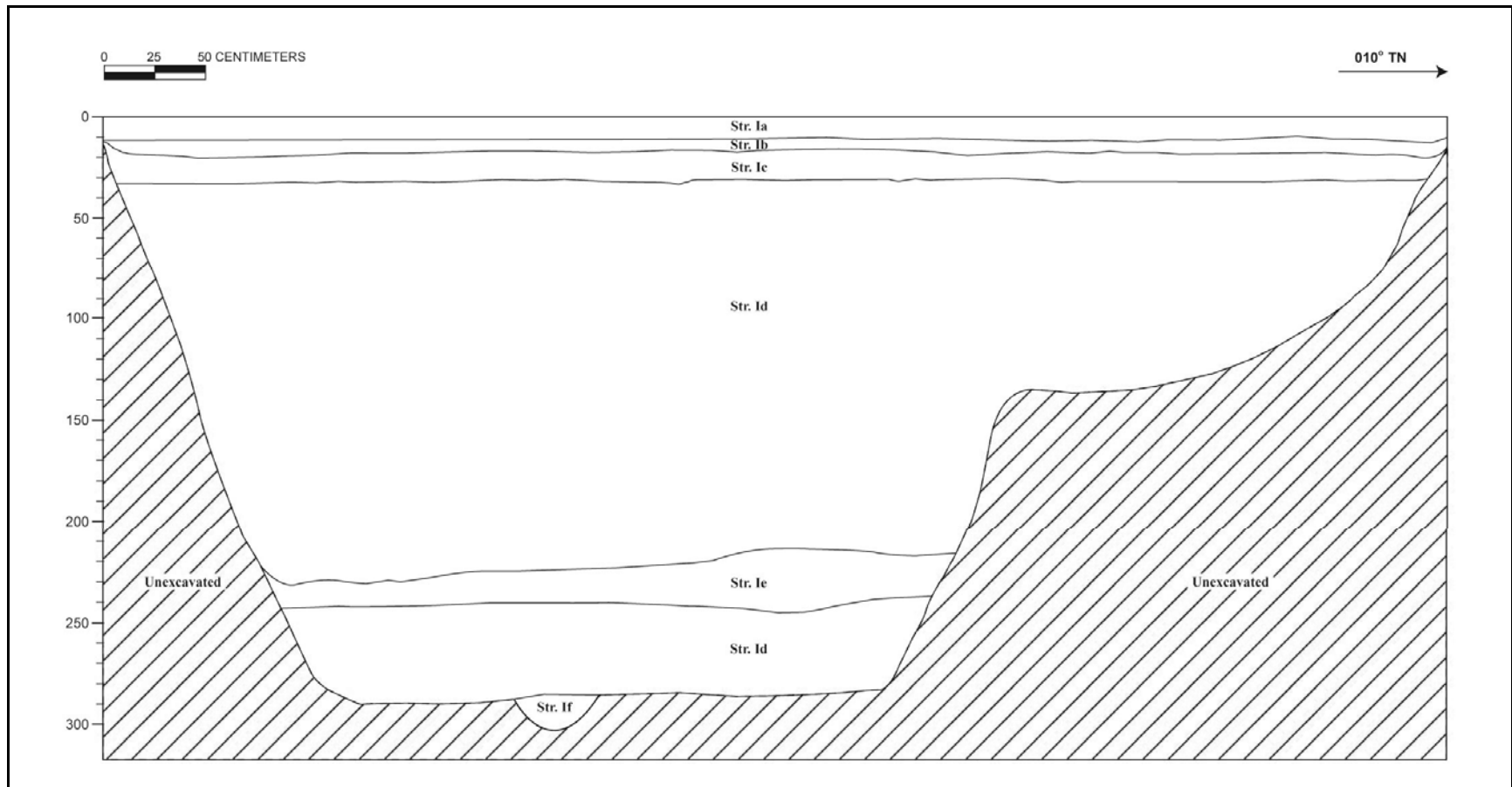


Figure 223. T-043 west profile (above) and stratigraphic description (below)

Stratum	Depth (cms)	Description
Ia	0-11	Asphalt, parking lot surface
Ib	11-17	Fill; gravel; structureless; moist, loose consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; few, fine to medium roots; base course
Ic	17-32	Fill; very gravelly silty loam; 5 YR 3/3 (dark reddish brown); weak, fine crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; few, medium roots
Id	32-231; 245-290	Fill; very gravelly cobbly sandy loam; 10 YR 7/4 (very pale brown); single-grain, structureless; moist, friable consistency; non-plastic; few, medium roots; crushed coral
Ie	215-245	Fill; loam; 10 YR 4/4 (dark yellowish brown); weak, fine crumb structure; moist, friable consistency; slightly plastic; mixed origin
If	285-305	Fill; very gravelly sandy clay; 10 YR 4/2 (dark grayish brown); single-grain, structureless; moist, friable consistency; slightly plastic; marine shell including <i>Cerithium</i> sp., <i>Turbo sandwicensis</i> , and <i>Trochus intextus</i> was collected; mixed origin; lower boundary not visible

7.2.44 Test Excavation 44

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-2-003:018
Street:	Ala Onaona Street (<i>makai</i> or south of the street)
Owner:	State DOT Airports Division
Elevation:	6.1 m
UTM:	611897.755 mE 2359482.225 mN
Max Length/Width/Depth:	6.95 m/0.76 m/2.5 m
Orientation:	98/278 TN
Targeted Project Component:	Honolulu International Airport Station
USDA Soil Designation:	Fill lands (FL)

Setting: Trench Excavation 44 (T-044) was located at the alternate (southern) station footprint within the Honolulu International Airport long-term parking lot, level with surrounding lot surface, 40 m south of Ala Onaona Street and 30 m east of Ala Auana Street (see Figure 217 and Figure 224).

Summary of Background Research and Land Use: Until the creation of the OR&L railway in the late 1800s (Figure 12), the area around T-044 was largely underdeveloped, scrubby pasture land. By the 1900s, the railway and irrigation improvements furthered development—particularly of Honolulu Plantation sugar cane fields. T-044 appears to be located within former sugar cane “Field 9” of the Honolulu Plantation (see Figure 17). There appears to have been a Honolulu Plantation railroad line in this immediate area running roughly parallel to, and approximately 400 m to the south of, the OR&L line. The 1933 map (see Figure 16) shows virtually no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (see Figure 19), however, shows a burst of recent residential and infrastructural development in the immediate area associated with military development during the beginning of WWII.

Documentation Procedures: Decomposing bedrock was encountered at 221 cmbs. Shoring was installed, stratigraphy was documented, and a bulk sample of Stratum II was taken at 170-180 cm. Excavation continued to solid bedrock.

Stratigraphic Summary: The stratigraphy, presented in Figure 225 and Figure 226, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib), and crushed coral fill (Stratum Ic and Id) overlying decomposing bedrock (Stratum II). The stratigraphy conforms to the USDA soil survey designation of Fill Lands (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: Test Excavation 44 Stratum Ic (a crushed coral fill layer) yielded three relatively large, relatively uncommon marine shells: the gastropod *Prodotia ignia* (11.3 g) and the bivalves *Chama fibula* (82.9 g) and *Arcidae barbatia* (11.1 g). Stratum Ic was identified as a 173 cm thick fill layer of silty fine sand. It is probable that these shells were deliberately collected for consumption (and would hence be midden); however, their context within the imported fill layer clearly indicates that these shells are not archaeologically significant.

A bulk sediment sample was recovered from Stratum II for wet-screening in order to further characterize the nature of the sediment. The sample was wet-screened with no significant results.

GPR Discussion: A review of amplitude slice maps showed linear features, which indicate the presence of utilities within the grid but not within the trench location. Reflectivity was relatively uniform throughout the grid and decreased with depth except for the utilities. A transition from higher reflectivity to lower reflectivity was observed at approximately 50 cmbs with the exception of the utilities.

GPR depth profiles for T-044 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 75-100 cmbs, but no changes in stratigraphy were observed during excavation. Utilities were observed in the GPR profile, but not within the excavation boundaries. The maximum depth of clean signal return was approximately 115 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-044 consisted of asphalt (Stratum Ia) overlying fill (Stratum Ib-Id) to decomposing bedrock (Stratum II). The layer of decomposing (Stratum II) bedrock extended to 250 cmbs (BOE), at which point hard bedrock was reached. No cultural resources were identified.



Figure 224. Photograph of Airport Section, T-044, general location, view to west



Figure 225. Photograph of Airport Section, T-044, general view of profile, view to southwest

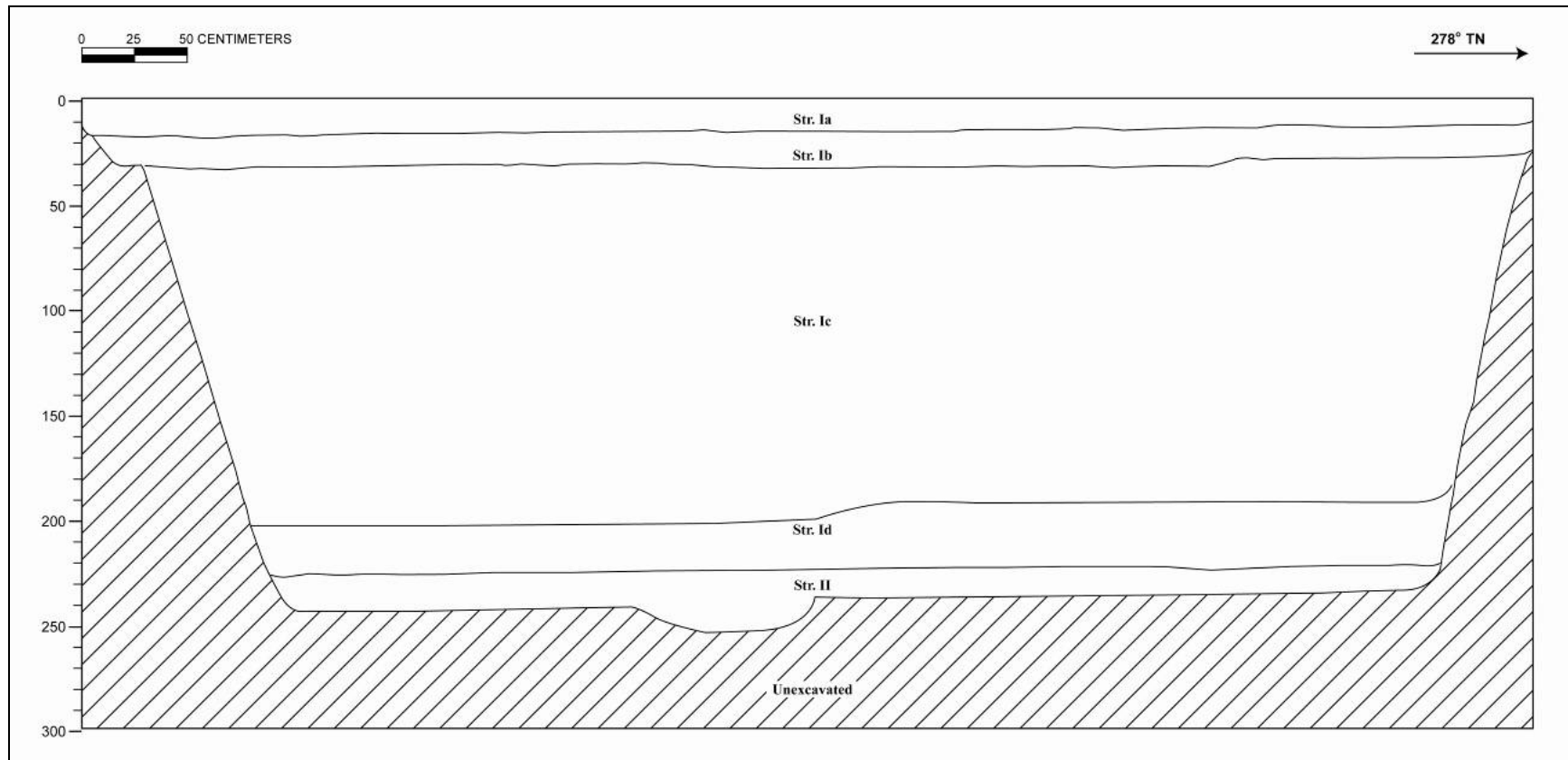


Figure 226. T-044 south profile and stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0-12	Asphalt, parking lot surface
Ib	12-30	Fill; very gravelly silty loam; 10 YR 3/2 (very dark grayish brown); weak, fine crumb structure; moist, friable consistency; non-plastic; terrigenous origin; very abrupt, smooth lower boundary; base course
Ic	27-200	Fill; silty sand; 2.5Y 6/4 (light yellowish brown); single-grain (fine), structureless; moist, loose consistency; non-plastic; marine origin; crushed coral
Id	190-221	Fill; silty sand; 2.5 Y 8/2 (pale yellow); single-grain (very fine), structureless; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; crushed coral
II	221-250	Natural; Decomposed bedrock; 10 YR 4/4 (dark yellowish brown); structureless, massive; moist; non-plastic; terrigenous origin; lower boundary not visible; decomposing bedrock

7.2.45 Test Excavation 45

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002:001
Street:	Ala Onaona Street (<i>makai</i> or south of the street)
Owner:	State DOT Airports Division
Elevation:	6.18 m
UTM:	611901.5382 mE 2359472.014 mN
Max Length/Width/Depth:	3.0 m/0.9 m/0.6 m
Orientation:	104/284 TN
Targeted Project Component:	Honolulu International Airport Station
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 45 (T-045) was located at the alternate (southern) station footprint in the airport parking lot on the *makai*/Diamond Head corner of Ala Onaona Street and Ala Auana Street (see Figure 217 and Figure 227).

Summary of Background Research and Land Use: Until the creation of the OR&L railway in the late 1800s (see Figure 12), the area around T-045 was largely underdeveloped pasture land. By the 1900s, the railway and irrigation improvements furthered development—particularly of Honolulu Plantation sugar cane fields. T-045 appears to be located within former sugar cane “Field 9” of the Honolulu Plantation (see Figure 17). There appears to have been a Honolulu Plantation railroad line in this immediate area running roughly parallel to, and approximately 400 m to the south of, the OR&L line. The 1933 map (see Figure 16) shows no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (see Figure 19), however, shows expansive residential and infrastructural development in the immediate area associated with military development during the beginning of WWII.

Documentation Procedures: Only asphalt and fill were exposed in the excavation. The excavation was stopped due to the presence of utilities in the crushed coral fill layer. There were multiple utilities extending through the excavation.

Stratigraphic Summary: The stratigraphy, presented in Figure 228 and Figure 229, consisted of asphalt (Stratum Ia), associated base course (Stratum Ib), and crushed coral fill (Stratum Ic) to the base of excavation. Excavation was halted due to the utilities that were encountered. The stratigraphy conforms to the USDA soil survey designation of Fill Lands (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps indicated no linear features, which might indicate the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 25 cmbs.

GPR depth profiles for T-045 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 25 cmbs. An anomaly was observed in the GPR profile around 45 cmbs, which could correspond to the fiber optic utilities found around that same depth. The maximum depth of clean signal return was approximately 100 cmbs (see Appendix E for more detail).

Summary: The stratigraphy of T-045 consisted of asphalt (Stratum Ia), associated base course (Stratum Ib), and crushed coral fill (Stratum Ic) to the base of excavation. At 60 cmbs, utilities were encountered and the excavation was stopped. No cultural resources were identified.



Figure 227. Photograph of Airport Section, T-045, general location, view to east



Figure 228. Photograph of Airport Section, T-045, general view of profile, view to northwest

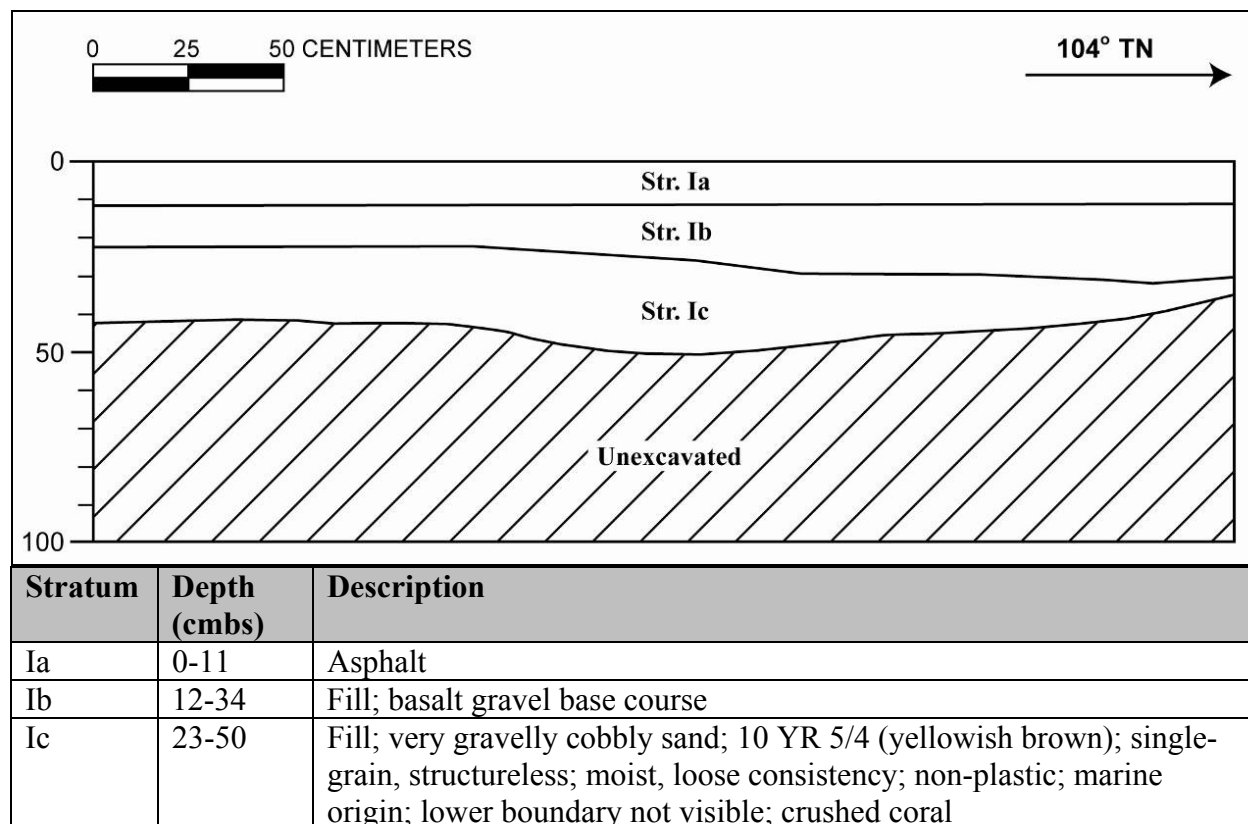


Figure 229. T-045 northeast profile and stratigraphic description

7.2.46 Test Excavation 46

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002:001
Street:	Ala Onaona Street (<i>makai</i> or south of the street)
Owner:	State DOT Airports Division
Elevation:	5.5 m
UTM:	611924.9349 mE 2359468.576 mN
Max Length/Width/Depth:	3.72 m/0.92 m/2.45 m
Orientation:	102/282 TN
Targeted Project Component:	Honolulu International Airport Station
USDA Soil Designation:	Fill Land (FL)

Setting: Test Excavation 46 (T-046) was located at the alternate (southern) station footprint in the airport parking lot on the *makai*/Diamond Head corner of Ala Onaona Street and Ala Auana Street (see Figure 217 and Figure 230). The excavation area was slightly elevated above the land surface in adjacent areas.

Summary of Background Research and Land Use: Until the creation of the OR&L railway in the late 1800s (see Figure 12), the area around T-046 was largely underdeveloped pasture land. By the 1900s the railway and irrigation improvements furthered development, particularly of Honolulu Plantation sugar cane fields. T-046 appears to be located within former sugar cane "Field 9" of the Honolulu Plantation (see Figure 17). There appears to have been a Honolulu Plantation railroad line in this immediate area running roughly parallel to, and approximately 400 m to the south of, the OR&L line. The 1933 map (see Figure 16) shows virtually no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (see Figure 19), however, shows expansive residential and infrastructural development in the immediate area associated with military development during the beginning of WWII.

Documentation Procedures: Excavation continued until 205 cmbs, when a concrete slab was encountered. Shoring was installed. It was agreed to break through the concrete using a jackhammer. The concrete (Stratum Ii) was removed revealing an asphalt surface (Stratum Ij) with associated base course (Stratum Ik) overlying a fill layer (Stratum II). Because of safety issues, excavation stopped at the fill layer (II) at 245 cmbs (BOE).

Stratigraphic Summary: The stratigraphy, presented in Figure 231 and Figure 232, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib), possible landscaping fill (Stratum Ic), crushed coral fill (Stratum Id), gravelly silty clay loam fill (Stratum Ie) crushed coral fill (Stratum If and Ig), gravelly sandy clay loam fill (Stratum Ih), a buried concrete slab (Stratum Iia), a buried asphalt pavement (Stratum Iib) and associated base course (Stratum Iic), and very

gravelly sandy loam (Stratum III) to the base of excavation. The stratigraphy conforms to the USDA soil survey designation of Fill Land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: No samples appropriate for laboratory analysis were collected in the field.

GPR Discussion: A review of amplitude slice maps did not indicate any linear features, although a utility was encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 25 cmbs.

GPR depth profiles for T-046 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 25 cmbs. No utilities were observed in the GPR profile although a utility was encountered during excavation. The maximum depth of clean signal return was approximately 85 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-046 consisted of the modern asphalt surface and associated base course (Stratum Ia and Ib), numerous layers of fill (Stratum Ic to Ih), and buried road or parking lot surface (Stratum IIa to IIc), and fill (Stratum III) to the base of excavation. Excavation was limited by the maximum reach of the excavator arm and bucket as well as safety concerns. The stratigraphy conforms to the USDA soil survey designation of Fill Land (FL). The buried road or parking lot surface (represented by Stratum IIa to IIc) within T-046 has been designated as a component of SIHP# 50-80-13-7421 Feature 2 (see Section 7.4.3).



Figure 230. Photograph of Airport Section, T-046, general location, view to west



Figure 231. Photograph of Airport Section, T-046, general view of profile, view to south

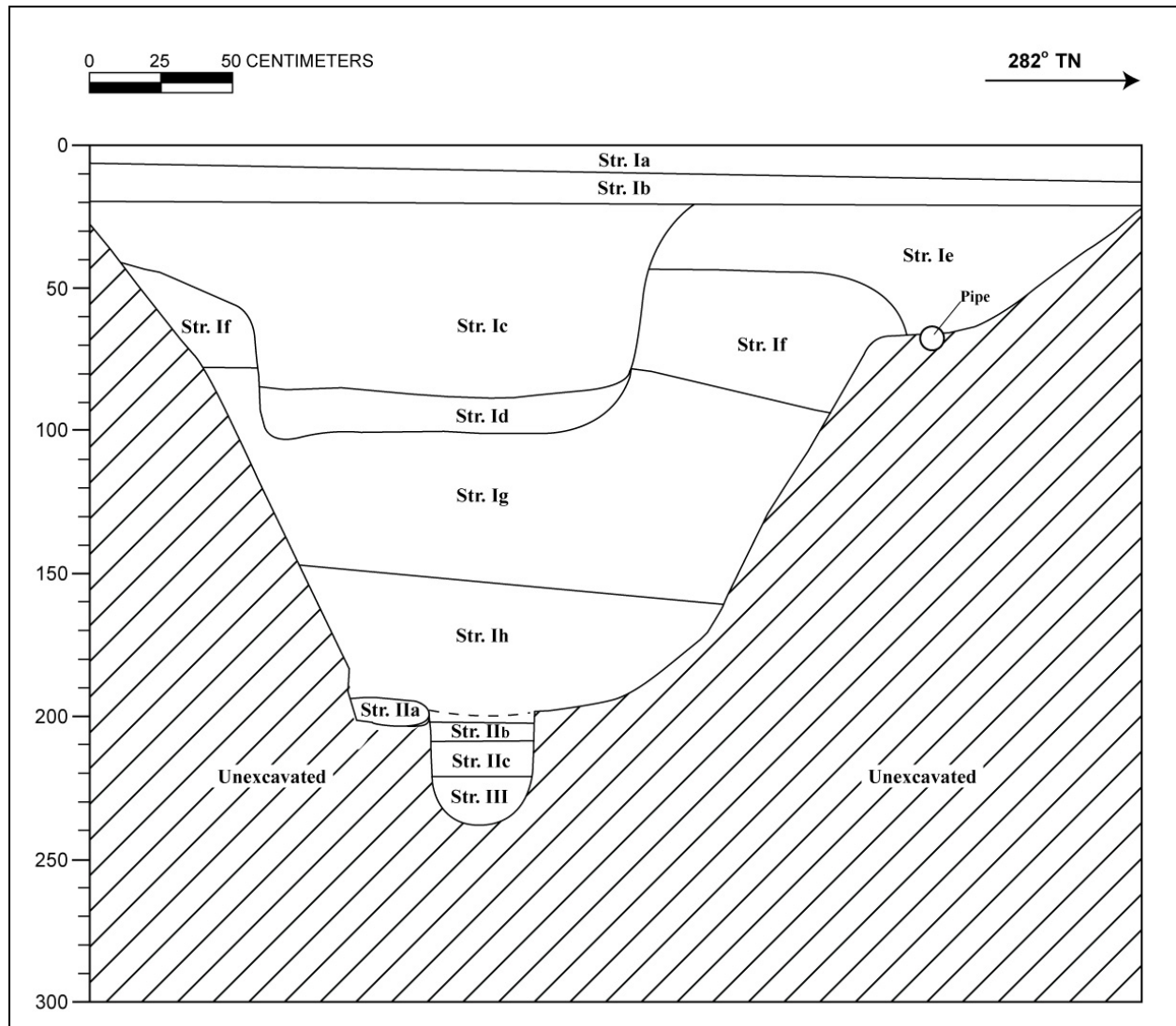


Figure 232. T-046 southwest profile (above) and stratigraphic description (below)

T-046 stratigraphic description

Stratum	Depth (cmbs)	Description
Ia	0-11	Asphalt
Ib	7-21	Fill; very gravelly sandy loam; 10 YR 3/1 (very dark gray); weak, fine crumb structure; moist, very friable consistency; non-plastic; terrigenous origin; very abrupt, smooth lower boundary; few, fine roots; base course
Ic	21-91	Fill; silty clay loam; 7.5 YR 3/3 (dark brown); weak, fine granular structure; moist, friable consistency; plastic; terrigenous origin; abrupt, discontinuous lower boundary; many, medium roots; possible landscaping fill
Id	89-105	Fill; sand; 10 YR 5/4 (yellowish brown); single-grain (fine-medium), structureless; moist, loose consistency; non-plastic; marine origin; abrupt, broken/discontinuous lower boundary; many, fine-medium roots
Ie	21-68	Fill; gravelly silty clay loam; 10 YR 3/4 (dark yellowish brown); weak, fine crumb structure; moist, friable consistency; plastic; terrigenous origin; clear, broken/discontinuous lower boundary; many, fine roots; contains basalt and coral gravel
If	45-98	Fill; sand; 2.5 YR 8/4 (pale yellow); single-grain (very fine), structureless; moist, loose consistency; non-plastic; marine origin; clear, broken/discontinuous lower boundary; crushed coral
Ig	81-165	Fill; sand; 10 YR 7/3 (very pale brown); single-grain (very fine), structureless; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; crushed coral
Ih	152-205	Fill; gravelly sandy clay; 7.5 YR 3/3 (dark brown); moderate, fine crumb structure; moist, friable consistency; plastic; mixed origin; few, coarse roots
Ila	200-208	Concrete; designated as a component of SIHP# 50-80-13-7421 Feature 2
Ilb	208-215	Asphalt; designated as a component of SIHP# 50-80-13-7421 Feature 2
Ilc	215-226	Fill; coral and basalt gravel base course; designated as a component of SIHP# 50-80-13-7421 Feature 2
III	226-245	Fill; very gravelly sandy loam; 10 YR 4/1 (dark gray); weak, very fine crumb structure, dry, loose consistency; non-plastic; mixed origin; lower boundary not visible

7.2.47 Test Excavation 47

Ahupua'a:	Moanalua
LCA:	Ali'i Award: LCA 7715 (to Kapuāiwa, Lot Kamehameha)
TMK #:	1-1-002:001
Street:	Ala Onaona Street (<i>makai</i> or south of the street)
Owner:	State DOT Airports Division
Elevation:	5.2 m
UTM:	612077.4764 mE 2359471.858 mN
Max Length/Width/Depth:	3.8 m/0.96 m/1.84 m
Orientation:	11/191 TN
Targeted Project Component:	Honolulu International Airport Station
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 47 (T-047) was located in the airport parking lot just east of the exit lanes, off of Ala Onaona Street (see Figure 142 and Figure 233). The area is fairly level with the surrounding land surface.

Summary of Background Research and Land Use: Until the creation of the OR&L railway in the late 1800s (Figure 12), the area around T-047 was largely underdeveloped, scrubby pasture land. By the 1900s, the railway and irrigation improvements furthered development—particularly of Honolulu Plantation sugar cane fields. T-047 appears to be located within former sugar cane “Field 9” of the Honolulu Plantation (see Figure 17). There appears to have been a Honolulu Plantation railroad line in this immediate area running roughly parallel to, and approximately 400 m to the south of, the OR&L line. The 1933 map (see Figure 16) shows virtually no development in this area (other than the outlines of rough roads bordering Honolulu Plantation sugar cane fields). The 1943 War Department Aiea quad map (see Figure 19), however, shows a burst of recent residential and infrastructural development in the immediate area associated with military development during the beginning of WWII.

Documentation Procedures: Initial excavation of T-047 stopped at 137 cmbs when archaeologists entered the trench and scraped the side walls, took photos, and recorded stratigraphic layers. A sample was taken from the excavator bucket from 170 cmbs. Shoring was installed and archaeologists entered the trench for exploration. A sample was taken from the side wall at 155-170 cmbs. Excavation continued to the coral shelf.

Stratigraphic Summary: The stratigraphy, presented in Figure 234 and Figure 235, consisted of asphalt (Stratum Ia) and associated base course (Stratum Ib), very gravelly sandy loam fill (Stratum Ic), and very gravelly loam fill (Stratum Id) overlying natural silty clay loam (Stratum II) to the coral shelf. The stratigraphy generally conforms to the USDA soil survey designation of Fill Land (FL), however, natural sediment (Stratum II) was encountered at 155 cmbs.

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Faunal Remains Discussion: No faunal remains were observed.

Other Lab Results: Two bulk sediment samples from Stratum II (from 155 and 170 cmbs) were collected for wet-screening in order to further characterize the nature of the sediment and for potential charcoal content. The sample from 170 cmbs was extracted from the excavator bucket, while the sample from 155 cmbs was collected from the trench wall. Wet-screening of both samples revealed numerous organics.

GPR Discussion: A review of amplitude slice maps indicated no linear features, which might indicate the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreased with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 75 cmbs.

GPR depth profiles for T-047 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponds to variations of density and chemical composition within fill deposits. The GPR profile also indicated a change in reflectivity occurring around 15 cmbs and again around 60 cmbs. An anomaly was observed in the GPR profile but was not observed during excavation. The maximum depth of clean signal return was approximately 115 cmbs (see Appendix E for more details).

Summary: The stratigraphy of T-047 consisted of asphalt (Stratum Ia) and fill (Stratum Ib to Id) overlying natural silty clay loam (Stratum II) to the coral shelf. The stratigraphy generally conforms to the USDA soil survey designation of Fill Land (FL), however, natural sediment (Stratum II) was encountered at 155 cmbs. No cultural resources were identified.



Figure 233. Photograph of Airport Section, T-047, general location, view to northeast



Figure 234. Photograph of Airport Section, T-047, general view of profile, view to southeast

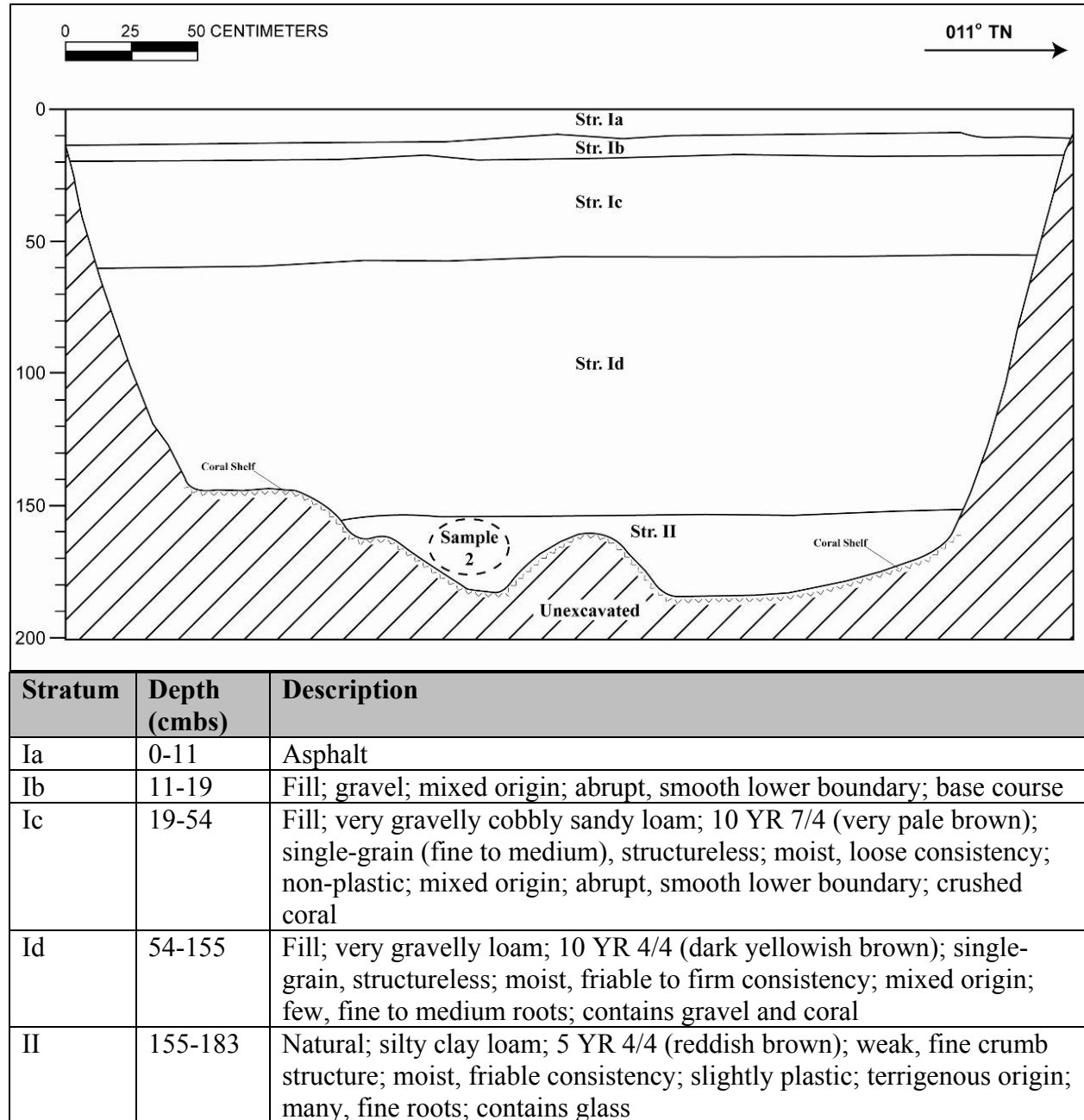


Figure 235. T-047 west profile (note that Sample 1 was collected from the backhoe bucket, so is not depicted on the profile) and stratigraphic description

7.3 Summary of Stratigraphy

The northwestern portion of the Airport Section is developed on tuff sediments derived from the tuff cones of the Salt Lake area. While these sediments relate primarily to the Āliamanu, Āliapaʻakai, and Makalapa eruptions of the Honolulu Volcanic Series there were a number of related but somewhat independent volcanic cones and vents (Figure 236) that further complicate the geologic picture.

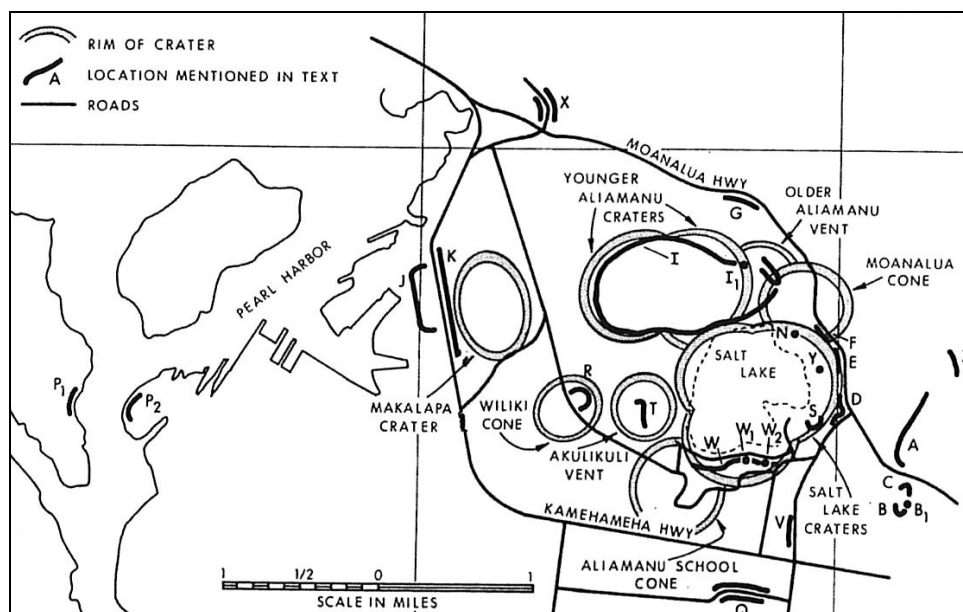


Figure 236. Honolulu Volcanic Series events of the Salt Lake area (from Pankiwsky 1972:243)

The Āliamanu volcanic event is the oldest and is associated with the Kaena (+29 m) Stand of the sea. The Salt Lake and Makalapa eruptions are understood as roughly contemporaneous during the Waipio (-12 m) Stand of the sea (MacDonald et al. 1983:440-441). Geologists have found dating these stands of the sea in an absolute sense to be exceedingly problematic. Some sources estimate a date of circa 600,000 years old +/- 100,000 years for the Kaena Stand (U.S. Department of the Interior 1979:180). Pankiwsky 1972:242) posits that later eruptions in the Salt Lake area were as recent as 100,000 years ago. Beds of gravel, sand and mudflow debris are “interfingered” with air-deposited tuff (MacDonald et al. 1983:445) which has often been re-worked and/or interbedded with coral limestone or marine sediments by the 40+ m eustatic change in sea level. Typically the naturally deposited sediments derived from this tuff are clays or silt clays often with pebble sized fragments of tuff.

Throughout the Airport Section what was particularly notable was the thickness of the fill deposits (see Table 9) which often exceeded the depth of the base of excavation at 3.0 m. This fill material was typically derived from the immediate vicinity and was hence often clays or silt clays derived from tuff. The discrimination of fill versus tuff was sometimes quite clear owing to the inclusion of historic debris and/or mottling or marbling or mixing with other sediments and with clear lower boundaries. In several cases the fill determinations were validated by the discovery of underlying asphalt or concrete. In other cases the distinction was subtle or unclear.

Table 9. Summary of Stratigraphy and Finds from Airport (Section 3) Test Excavations

#	Max Depth of Fill (cmbs)	BOE (cmbs)	Stratigraphy	Contents
01	295+	295	Fill (295+ cm thick) to BOE (fill continues beyond BOE)	1 <i>Chama iostoma</i> shell
02	280	280	Fill (280 cm thick) to BOE (BOE was bedrock)	No significant finds
03	130	195	Fill (130 cm thick) overlying naturally deposited clay loam sediment with decomposing coral and a bivalve shell from 130- 195 cmbs, BOE at 195 (BOE was sterile naturally deposited clay loam)	Naturally deposited clay loam with decomposing coral and a bivalve shell
04	180	185	Fill (180 cm thick) to BOE (BOE was bedrock)	No significant finds
05	60	125	Fill (60 cm thick) overlying naturally deposited extremely gravelly sandy clay loam from 60 - 85 cmbs; (BOE was bedrock)	No significant finds
06	100	212	Fill (100 cm thick) overlying naturally deposited silt loamy cobbly stony clay from 95 -212 cmbs (BOE was sterile clay)	No significant finds
07	243	243	Fill (243 cm thick) to BOE (BOE was bedrock)	Poured concrete block, glass, shell, slag, sign post foundation
08	17	40	Fill (17 cm thick) overlying decomposing bedrock (BOE was bedrock)	No significant finds
09	31	50	Fill (31 cm thick) overlying decomposing bedrock (BOE was bedrock)	No significant finds
10	20	55	Fill (20 cm thick) overlying decomposing bedrock (BOE was bedrock)	No significant finds
11	15	50	Fill (15 cm thick) overlying decomposing bedrock (BOE was bedrock)	No significant finds
12	39	78	Fill (39 cm thick) overlying bedrock (BOE was bedrock)	No significant finds
13	195	195	Fill (195 cm thick) overlying bedrock (BOE was bedrock)	No significant finds
14	290+	290	Fill (290+ cm thick), BOE was fill	No significant finds
15	290+	290	Fill (290+ cm thick), BOE was old, buried asphalt roadway	Buried roadway regarded as part of an archaeological cultural resource
16	178+	178	Fill (178+ cm thick), BOE was fill	No significant finds

#	Max Depth of Fill (cmbs)	BOE (cmbs)	Stratigraphy	Contents
17	155	285	Fill (total 155 cm thick) overlying a paved area overlying fill overlying naturally deposited clay loam at 155 cmbs (BOE was tuff bedrock)	Asphalt pavement at 80-95 cm regarded as part of an archaeological cultural resource
18	200	305	Fill (total 200 cm thick) overlying concrete and asphalt (30 cm thick) overlying fill to 200 cmbs overlying naturally deposited clay to tuff at 295 cmbs (BOE is tuff)	Concrete and asphalt are regarded as part of an archaeological cultural resource
19	99	290	Fill (99 cm thick) overlying clay at 84 cm BOE is sterile naturally deposited clay	No significant finds
20	100	190	Fill (100 cm thick) overlying naturally deposited clay	No significant finds
21	75	230	Fill (75 cm thick) overlying silty sand (70-110 cmbs) overlying clay (110 -225) overlying a limestone shelf	The coral paving surface or road (60-110 cmbs) is regarded as part of an archaeological cultural resource
22	140	304	Fill (140 cm thick) overlies naturally deposited silty clay loam.	No significant finds
23	115	115	Fill (up to 121 cm thick) overlies a concrete surface	Concrete surface is regarded as part of an archaeological cultural resource
24	108	108	Fill above concrete slab; Concrete slab at the base of trench at 108 cmbs	Concrete slab is regarded as part of an archaeological cultural resource
25	90	90	Fill above concrete slab; Concrete slab at the base of trench at 90 cmbs	Concrete slab is regarded as part of an archaeological cultural resource
26	82	82	Fill above concrete slab; Concrete slab at the base of trench at 82 cmbs	Concrete slab is regarded as part of an archaeological cultural resource
27	179	282	Fill (179 cm thick) overlies silty clay loam.	No significant finds
28	205	205	Fill (205 cm thick) overlies limestone	No significant finds

#	Max Depth of Fill (cmbs)	BOE (cmbs)	Stratigraphy	Contents
			bedrock	
29	138	138	Fill (138 cm thick) overlies limestone bedrock	No significant finds
30	305+	305	Fill (305+ cm thick) to BOE	No significant finds
31	66	66	Fill (66 cm thick) to coral limestone BOE	No significant finds
32	105	133	Fill (105 cm thick) overlying naturally deposited clay loam overlying coral limestone BOE	No significant finds
33	128	150	Fill (128 cm thick) overlying naturally deposited clay loam overlying coral limestone BOE	No significant finds
34	52	151	Fill (52 cm thick) overlying naturally deposited clay loam overlying coral limestone BOE	No significant finds
35	157	200	Fill (157 cm thick) overlying naturally deposited silty clay overlying a coral limestone shelf	No significant finds
36	160	212	Fill (160 cm thick) overlying naturally deposited silty clay loam overlying a coral limestone shelf	No significant finds
37	97	132	Fill (97 cm thick) overlying naturally deposited sandy clay loam overlying a coral limestone shelf	No significant finds
38	258	270	Fill (258 cm thick) overlying naturally deposited gleyed sandy clay at 258 cmbs (water table at 253 cmbs)	No significant finds
39	128	200	Fill (at least 128 cm thick) overlying silty clay to the water table at 190 cmbs (unclear whether the silty clay is natural or fill)	No significant finds
40	43	43	Fill to the water table (at approx. 38 cmbs)	No significant finds
41	107	230	Fill (107 cm thick) overlying naturally deposited clay (103 cm thick) overlying decomposing bedrock	No significant finds
42	181+	181	Fill above concrete slab; Concrete slab at the base of trench at 181 cmbs	Concrete slab is regarded as part of an archaeological cultural resource
43	293+	2305	Fill above gravelly sandy clay over decomposing coral limestone	No significant finds

#	Max Depth of Fill (cmbs)	BOE (cmbs)	Stratigraphy	Contents
44	245	305	Fill (245 cm thick) above natural gravelly sandy clay	No significant finds
45	50+	50	Fill to 50+ cmbs, Excavation was halted due to utilities encountered.	No significant finds
46	245+	245	Fill to BOE at 245 cmbs	No significant finds
47	155	183	Fill (155 cm thick) overlying natural silty clay loam	No significant finds

Starting at the northwest end of the Airport Section, it seems clear that the natural land surface in the vicinity of T-001 to T-004 was low-lying mudflats at the mouth of Hālawā Stream (see in particular Figure 11). The 185+ cm of fill in this area was largely to raise the land surface for a road that would become Kamehameha Highway. It seems probable that much of this fill was deposited prior to construction for a road that first shows up in the 1933 map (Figure 16).

It appears that from near the south bank of Hālawā Stream almost to Lagoon Station the Airport Section corridor was under commercial sugar cane cultivation by the Honolulu Plantation (1899-1947) for decades. The numbered sequencing of fields in this area (see Figure 17), suggests expansion towards the coast with higher numbered fields being seaward. It seems probable that some movement of sediment onto seaward areas of bare tuff and shallow clay soils occurred to expand sugar cane acreage but this practice seems to have gone undocumented.

The picture of the history of fill deposits is significantly complicated by what appears to have been the substantial development of the Airport Section corridor, particularly in the vicinity of what becomes Honolulu International Airport during and after World War II. The very substantial fill activities and airport construction, especially those associated with 1942-1943, are readily apparent in a comparison of the 1933 (see Figure 16) and 1943 (see Figure 19) U.S. Army maps for this area. Fill activities have pushed the shoreline more than 500 m southeast from the Honolulu International Airport Station. The vicinity of the project lands have been rapidly developed with roads and elongated warehouse-like buildings. There was likely substantial earth moving in the corridor and vicinity associated with this military build-up of 1942/1943. Perhaps not all of the 442,000+ active duty military stationed in Hawaii in 1944 (compared to < 28,000 in 1940; Schmidt 1977:661) were engaged in earth moving but that was clearly a major occupation. Earthwork associated with various transportation (road and airport) improvement efforts before and after World War II further complicates the picture.

While the artifact assemblage was quite meager, the discovery of a beer bottle at T-018 (from a massive 125 cm thick Stratum Ie extending down to 200 cmbs) and a Coca-Cola bottle at T-041 (at 140 cmbs) both conveniently dating to 1942 supply further proof for the dating of overlying fill episodes. The identification of concrete slabs buried under as much as 181 cm of overlying fill (at T-042) and up to 290 cm (at T-015) of fill overlying asphalt attest to the industry of land transformation along the Airport Section.

7.4 Cultural Resource Descriptions

7.4.1 Introduction to the Two Airport Section Archaeological Cultural Resources

Presented below is a summary table of material remains that were considered as potential archaeological cultural resources (Table 10). Some of these finds are disturbed and isolated historic refuse and historic features (for example a sign post) that lack integrity and are not considered components of archaeological cultural resources. Other material remains are suggested to be components of two distinct archaeological cultural resources: remnants of former mid-twentieth century roads, and remnants of World War II warehouse foundations and infrastructure constructed in 1942/1943. These two archaeological cultural resources have the integrity and information potential to be considered significant archaeological cultural resource/historic properties eligible for the National and Hawaii Register of Historic Places.

Table 10. Material Remains Considered as Potential Archaeological Cultural Resources, by Test Excavation (T) (* indicates regarded as part of an archaeological cultural resource)

T	Provenience	Nature of Find	Comment
-015	II 286-290 cmbs	Asphalt roadway*	Relates to in-situ asphalt in Test Excavation 17 and 18
-017	IIa/IIb 80-155 cm	Asphalt pavement*	Relates to in-situ asphalt in Test Excavations 15 and 18
-018	IIa-IIc 25-200 cmbs	Asphalt and Concrete layers*	Relates to in-situ asphalt in Test Excavations 15 and 17
-018	IIc 75-200 cmbs	Beer bottle	Beer bottle dated to 1942
-021	IIa/IIb 60-110 cmbs	Compact coral pavement*	Probably relates to concrete slabs in T-023-026, 042, and 046
-023	II 115cmbs	Concrete slab*	Probably relates to concrete slab in T-021, 024-026, 042, and 046
-024	II 108cmbs	Concrete slab*	Probably relates to concrete slab in T-021, 023, 025, 026, 042, and 046
-025	II 90cmbs	Concrete slab*	Probably relates to concrete slab in T-021, 023, 024, 026, 042, and 046
-026	II 82 cmbs	Concrete slab*	Probably relates to concrete slab in T-021, 023-025, 042, and 046
-041	II 140 cmbs	Coca-Cola bottle	Coca-Cola bottle dated to 1942
-042	Beneath Id 181 cmbs	Concrete slab*	Probably relates to concrete slabs in T-021, 023-026, and 046
-046	IIa-IIc 200-226 cmbs	Concrete and Asphalt layers*	Probably relates to concrete slab in T-021, 023-026, 042

The beer (T-018) and Coca-Cola (T-041) bottles that were found in imported fill layers were regarded as discarded rubbish without any integrity of context. These two bottles, both found in fill layers, both help date the deposition of the fill layers they were found in.

The asphalt surfaces and concrete slabs were however regarded as having integrity, as being over fifty years old, and as having a historic context on the basis of overlays on historic maps. These buried remnants are considered parts of archaeological cultural resources. They are located on Figure 237 and Figure 238 and are summarized below.

In consultation with the SHPD, two State Inventory of Historic Property (SIHP) numbers have been assigned: SIHP 50-80-13-7420 and 50-80-13-7421. The buried remnants of the three roadway pavement segments observed in Test Excavations 15, 17, and 18 have been designated as components of SIHP 50-80-13-7420 (Features 1 to 3) The buried remnants of concrete slabs (Test Excavations 23, 24, 25, 26, 42, and 46), and the crushed coral prepared roadway or paving surface (Test Excavation 21), have been designated as components of SIHP 50-80-13-7421. Because the slab identified in T-041, T-042, and T-046 was significantly south of the slab(s) identified in T-023, T-024, T-025, T-026 these are treated as two features (Feature 1 to the north and feature 2 to the south). The crushed coral paving layer has been assigned Feature 3. These archaeological cultural resources are located on the following Figure 237 and Figure 238 and, in order to show historical context, are overlain on a 1933 map (Figure 239), a 1943 map (Figure 240) and a 1953 map (Figure 241).

7.4.2 SIHP 50-80-13-7420

Formal Type:	Road
Number of Features:	3
Functional Interpretation:	Vehicular transportation
Age:	Post-Contact, mid-twentieth century
Current Dimensions:	Feature 1 was only observed in T-015, a 3.04 m long by 1.10 m wide excavation, Feature 2 was only observed in T-017, a 3.00 m long by 1.07 m wide excavation, Feature 3 was only observed in T-018, a 3.00 m long by 1.07 m wide excavation.
Location: Excavations	Feature 1 was identified in T-015, between the H-1 Freeway (east or <i>mauka</i>) and Makai Frontage Road (west or <i>makai</i>) and Features 2 and 3 were identified in T-017 and T-018 on the <i>makai</i> side of Nimitz Highway
Tax Map Key:	[1] 1-1-010 plat
Land Jurisdiction:	State DOT

SIHP 50-80-13-7420 consists of three buried asphalt road sections, with the asphalt road remnant at T-015 designated as SIHP 50-80-13-7420 Feature 1, the asphalt road remnant at T-017 designated as SIHP 50-80-13-7420 Feature 2, and the asphalt road remnant in T-018 designated as SIHP 50-80-13-7420 Feature 3 (see Figure 237 and Figure 238). All three are

interpreted to be remnants of mid-20th century road system in the area that were buried by subsequent modern development. The geographic extent of these roadway features are not well known based on the Airport AIS test excavation sampling strategy; it is likely that similar type features are still preserved in the vicinity of T-015, T-017, and T-018. At this time it is unclear how continuous these buried roadway features are.

SIHP 50-80-13-7420 Feature 1

All that was observed of SIHP 50-80-13-7420 Feature 1 was a buried asphalt pavement layer at 286-290 cmbs (Stratum Ie) spanning the length and width of T-015. The excavation sidewalls of T-015 were fairly unstable, consisting of unconsolidated fill material with loosely held cobbles/boulders. Uneven sidewalls with loose stratigraphy and overhangs created by falling boulders made it impossible to safely shore the excavation, so archaeologists could not enter T-015 to more completely document the asphalt roadway surface. The asphalt layer is at least 4 cm thick, but because of the hardness of the asphalt surface and the depth it was encountered at, the excavation could not proceed through the asphalt layer. Accordingly, the overall thickness of the asphalt layer is unknown. The asphalt layer's resistance to backhoe excavation indicates it is compact and well made.

A close-up of a 1933 map (Figure 239) indicates that the buried roadway surface identified in T-015 was a former alignment of what is now Kamehameha Highway that was developed immediately adjacent to the *makai* side of the OR&L rail line perhaps circa 1930. Subsequent realignments of Kamehameha Highway appear to have left this former alignment within a landscaped median strip.

By inference from historic maps this stretch of former road may extend in a northwest/southeast direction (particularly to the southeast) for 100 m or more.

SIHP 50-80-13-7420 Feature 2

All that was observed of SIHP 50-80-13-7420 Feature 2 was a buried asphalt pavement layer at 80-95 cmbs (Stratum Id) spanning the length and width of T-017. This 15 cm thick asphalt paving layer overlays a 60 cm thick, crushed-coral, roadway base course layer (Stratum Ie). The excavation easily continued through this asphalt layer suggesting that it was a relatively minor roadway.

Based on T-017's overlay on historic maps, SIHP 50-80-13-7420 Feature 2 was located on the seaward side of the OR&L alignment and does not show up on the 1943 map (Figure 240). It does appear to be present on the 1953 map (Figure 241). It is unclear whether this was a minor development of the WWII build-up, but it seems likely, with the road being abandoned and covered soon after. Nothing other than a 1940s/early 1950s roadway is indicated.

SIHP 50-80-13-7420 Feature 3

SIHP 50-80-13-7420 Feature 3 consists of buried roadway remnants including a concrete curbing section found immediately beneath an asphalt paving layer. This roadway feature was documented in T-018. The overlying asphalt layer, Stratum Ic, was 20 cm thick and found 25 to 45 cmbs. The underlying concrete curbing, Stratum Id, was 30 cm thick and found 45 to 75 cmbs. The overlying asphalt layer extended across the entire trench footprint, but the deeper concrete curbing was only observed in T-018's southeast sidewall. This curbing was observed

along the along entire southeast sidewall. As with Feature 2 described above, beneath these pavement layers a thick (125 cm) layer of crushed coral fill, Stratum Ie, had been deposited, potentially as a roadway base course.

Cleaning and inspection of the T-018 sidewall revealed that the concrete curbing (Stratum Id) was smooth and lacked noticeable form scars from when the concrete was poured. The regularity of the poured concrete feature's surface and the lack of form scars indicate that the curbing was installed in a standardized, potentially repetitive manner, and that it was produced by skilled labor. The lack of observed seams in the curbing for the entire 3 m section exposed in the sidewall of T-018 indicates that the curbing was produced in relatively large pours, more on an industrial scale. The concrete curbing was well preserved and unweathered.

A single isolated beer bottle was recovered from Stratum Ie, the crushed coral fill directly beneath the roadway Feature 3. The Regal Amber Brewing Co. bottle was manufactured in San Francisco in 1942 (see Artifact Analysis Section, 8.1 and Figure 234), clearly indicating that the thick crushed coral fill layer was deposited in 1942 or later.

That the Feature 3 roadway feature dates to 1942 or later coincides with evidence from historic maps. Based on T-018's overlay on historic maps, SIHP 50-80-13-7420 Feature 3 was located on the seaward side of the OR&L alignment and does not show up on the 1943 map (Figure 240). It does appear to be present on the 1953 map (Figure 241).

SIHP 50-80-13-7420 Significance

The identified asphalt pavement and concrete curbing features of SIHP 50-80-13-7420 are not spectacular archaeological cultural resources. Based on their stratigraphic position, their plotted location in relation to mid-twentieth century roadways shown on historic maps, and the characteristics of the features themselves, they are older than 50 years. They appear to relate to the network of territorial government and military roadways that were developed in the 1930s and 1940s as Kamehameha Highway was constructed and the area was opened up for development.

SIHP 50-80-13-7420 is an archaeological site; it is buried and not to be confused with surface, in-use, or remnant roadway structures. It maintains integrity of location, design, materials, and potentially of workmanship (if more were to be exposed). It has information to impart related to the geographic distribution/extent, materials, and construction methods of these mid-twentieth century roads. The geographic information can be used to supplement and validate information available from historic maps, and archaeological information on roadway materials and characteristics (such as asphalt thickness and the presence of form scars on poured concrete features) inform on construction methods.

Accordingly, CSH recommends SIHP 50-80-13-7420 eligible to the Hawaii Register of Historic Places and the National Register of Historic Places under Significance Criterion D (has yielded, or is likely to yield, information important for research on prehistory or history). This information has been recorded in T-015, T-017, and T-018 in the form of geographic location of these deposits, the materials used in their construction, and the construction methods used to create these mid-twentieth century roadways. There is potential for additional similar information from similar pavement deposits in the vicinity.

The historic archaeological remnants of this roadway network are buried and their surroundings have been completely altered by modern development since their time of construction and period of use (for example, the massive construction of the H-1 Viaduct immediately adjacent). Accordingly these features do not maintain the integrity of setting, feeling, and association that might convey the roadways' significance under any other significance criteria of the Hawai'i or National Register of Historic Places.

7.4.3 SIHP 50-80-13-7421

Formal Type:	Foundations (concrete slabs) and road surface
Number of Features:	3
Functional Interpretation:	Storage and vehicular transportation
Age:	WWII
Current Dimensions:	170 m east/west by 80 m north/south
Location: Excavations	T-021, T-022, T-023, T-024, T-025, T-026, T-042, and T-046
Tax Map Key:	[1] 1-1-002:001
Land Jurisdiction:	State DOT Airports Division

SIHP 50-80-13-7421 consists of a crushed coral road surface and two sections of buried concrete slabs located at and near the Honolulu International Airport Station and Alternate A Station locations. A *mauka* section of concrete slabs (documented in T-023, T-024, T-025, and T-026 at the Honolulu International Airport Station) is designated as SIHP 50-80-13-7421 Feature 1, a *makai* section of concrete slabs (documented in T-042 and T-046 located at the Alternate A Station) is designated as SIHP 50-80-13-7421 Feature 2, and the crushed coral road surface (documented in T-021 just 'ewa of the Honolulu International Airport Station) is designated SIHP 50-80-13-7421 Feature 3 (see Figure 237 and Figure 238).

A 1943 War Department map (Figure 240) indicates that in the great burst of military infrastructure development in 1942/1943, an extensive area of large buildings, understood as warehouses, was developed in the immediate area of SIHP 50-80-13-7421. Additionally, a railroad spur line ran south from the OR&L rail line forming a loop in the immediate vicinity of SIHP 50-80-13-7421. It seems likely that the Features 1 and 2 concrete slabs were prepared, hard surfaces, possibly functioning as receiving aprons, docks, or warehouse foundations, and the Feature 3 crushed coral road was a prepared, hard but permeable, road surface, which facilitated the mass movement of large quantities of heavy material and supplies from the rail line spur to the adjacent warehouses, which were almost certainly created in 1942/1943. A 1953 Army Mapping Service map (Figure 241) no longer depicts distinct structures, but the area around SIHP 50-80-13-7421 is shaded, which indicates developed lands. It appears that in subsequent years, the concrete slabs and crushed coral road surfaces were abandoned and covered over once the warehouse buildings were demolished.

SIHP 50-80-13-7421 Feature 1

SIHP 50-80-13-7421 Feature 1 is comprised of buried concrete slabs located at varying depths within test excavations T-022, T-023, T-024, T-025, and T-026. In every trench except T-022, a concrete slab overlain with a thin red film was encountered beneath a modern asphalt parking lot surface and several layers of fill. In each of those cases, the concrete slab extended beyond the lower boundaries of the trench. In T-022, an intact concrete slab was not encountered; however, large concrete slab pieces were documented within the top layer of Stratum Id, beneath a modern asphalt parking lot surface and fill layers. As the concrete slabs in every trench but T-022 extended past the trench boundaries, the total aerial extent of the slabs (which could be one or more large slabs spanning several trenches or several small slabs spanning one or more trenches) remains unknown. The total estimated area of the Feature 1 concrete slabs is minimally 50 m east/west by 15 m north/south, but it could be significantly greater and/or the shape of the area of the slabs could be irregular.

The buried slabs were encountered at varying depths within each trench. In T-022 the disturbed concrete pieces were encountered at approximately 90 cmbs. In T-023 the concrete slab was encountered at 115 cmbs. In T-024 the concrete slab was encountered at 108 cmbs. In T-025 the concrete slab was encountered at 90 cmbs. In T-026 the concrete slab was encountered at 82 cmbs. It can be seen that the depth of the in situ concrete slabs decreased slightly from east to west (from T-023 to T-026). Efforts to break through the in situ slabs were unsuccessful, suggesting a thickness greater than 10 cm.

SIHP 50-80-13-7421 Feature 2

SIHP 50-80-13-7421 Feature 2 is comprised of buried concrete slabs located at varying depths within test excavations T-042 and T-046. In both trenches, a concrete slab was encountered beneath a modern asphalt parking lot surface and several layers of fill. In each case, the concrete slab extended across the base of excavation (note that in T-046, this was a very small portion of the trench). As the concrete slabs appeared to extend beyond the boundaries of the trenches, the total aerial extent of the slabs remains unknown; however, concrete slabs were not encountered in adjacent excavations (T-043, T-044, and T-45) that lie between T-042 and T-046. This suggests that more than one concrete slab is present in this area and forms Feature 2.

In T-042 the concrete slab was encountered at 181 cmbs, while in T-046 the concrete slab was encountered at 200 cmbs. In T-046, the concrete slab was busted through using a jackhammer. This revealed that the concrete was 8 cm thick and was overlying a layer of asphalt pavement that was 6 cm thick, which had an associated 11 cm thick coral and basalt gravel base course layer, which overlaid a layer of fill material.

SIHP 50-80-13-7421 Feature 3

SIHP 50-80-13-7421 Feature 3 is comprised of a compact crushed coral road surface that was located within test excavation T-021. The crushed coral road surface was encountered beneath fill layers and extended across the base of excavation of the trench. As this pavement layer extended beyond the boundaries of the trench, its total aerial extent remains unknown. The crushed coral road surface ranged in depth from 60 to 75 cmbs and had an associated 40 cm thick crushed coral base coarse layer.

SIHP 50-80-13-7421 Significance

The identified crushed coral road surface and concrete slab features of SIHP 50-80-13-7421 are modest archaeological cultural resources. Based on their stratigraphic position, their plotted location in relation to mid-twentieth century roadways shown on historic maps, and the characteristics of the features themselves, they are older than 50 years. They appear to relate to the great burst of military infrastructure development in 1942/1943.

SIHP 50-80-13-7421 is an archaeological site; it is buried and not to be confused with surface, in-use, or remnant buildings or structures. It maintains integrity of location, design, materials, and potentially of workmanship (if more were to be exposed). It has information to impart related to the geographic distribution/extent, materials, and construction methods of these mid-twentieth roads and foundations. The geographic information can be used to supplement and validate information available from historic maps, and archaeological information on feature materials and characteristics inform on construction methods.

Accordingly, CSH recommends SIHP 50-80-13-7421 eligible to the Hawaii Register of Historic Places and the National Register of Historic Places under Significance Criterion D (has yielded, or is likely to yield, information important for research on prehistory or history). This information has been recorded in T-021 through T-026, T-042, and T-046 in the form of geographic location of these deposits and the materials used in their construction. There is potential for additional similar information from similar deposits in the vicinity.

The historic archaeological remnants of these warehouse structures and associated roadway are buried, and their surroundings have been completely altered by modern development since their time of construction and period of use (e.g., the massive construction of Honolulu International Airport immediately adjacent). Accordingly these features do not maintain the integrity of setting, feeling, and association that might convey their significance under any other significance criteria of the Hawaii or National Register of Historic Places.

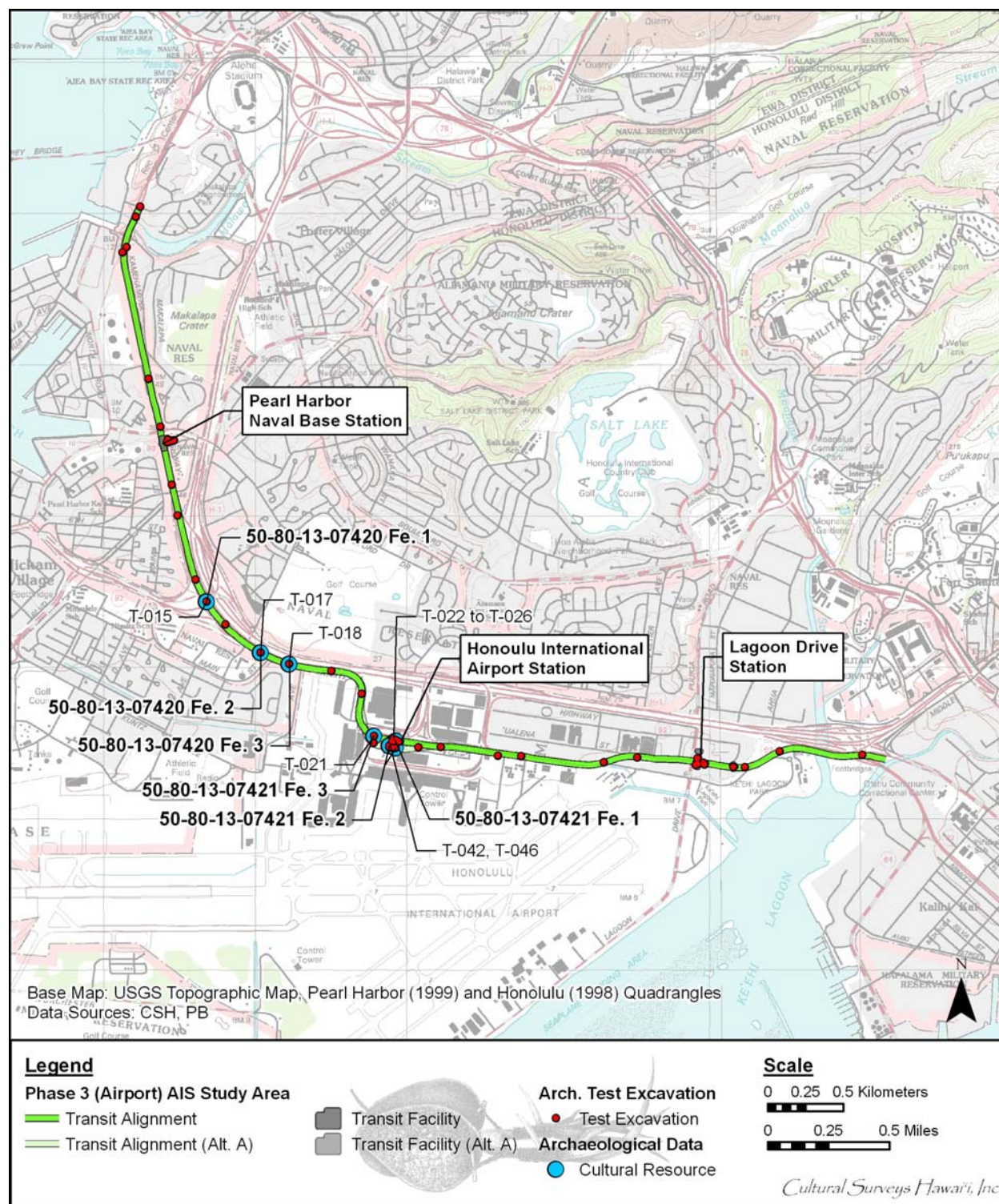


Figure 237. Locations of two archaeological cultural resources (SIHP 50-80-13-7420 and -7421) identified in the Airport Section of the HHCTCP corridor (on 1990s series U.S. Geological Survey maps)

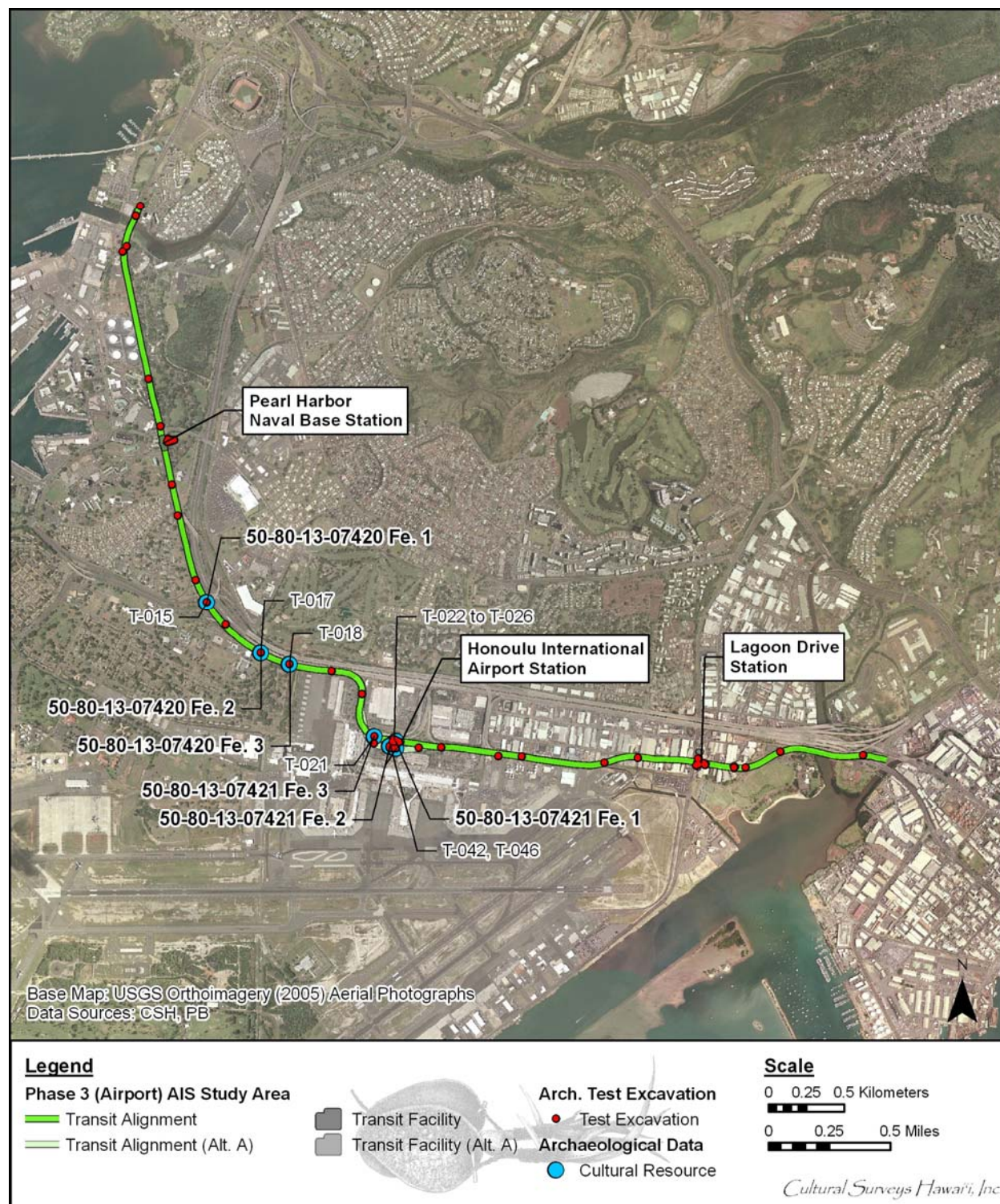


Figure 238. Locations of two archaeological cultural resources (SIHP 50-80-13-7420 and -7421) identified in the Airport Section of the HHCTCP corridor (on a 2005 U.S. Geological Survey Orthophotograph)

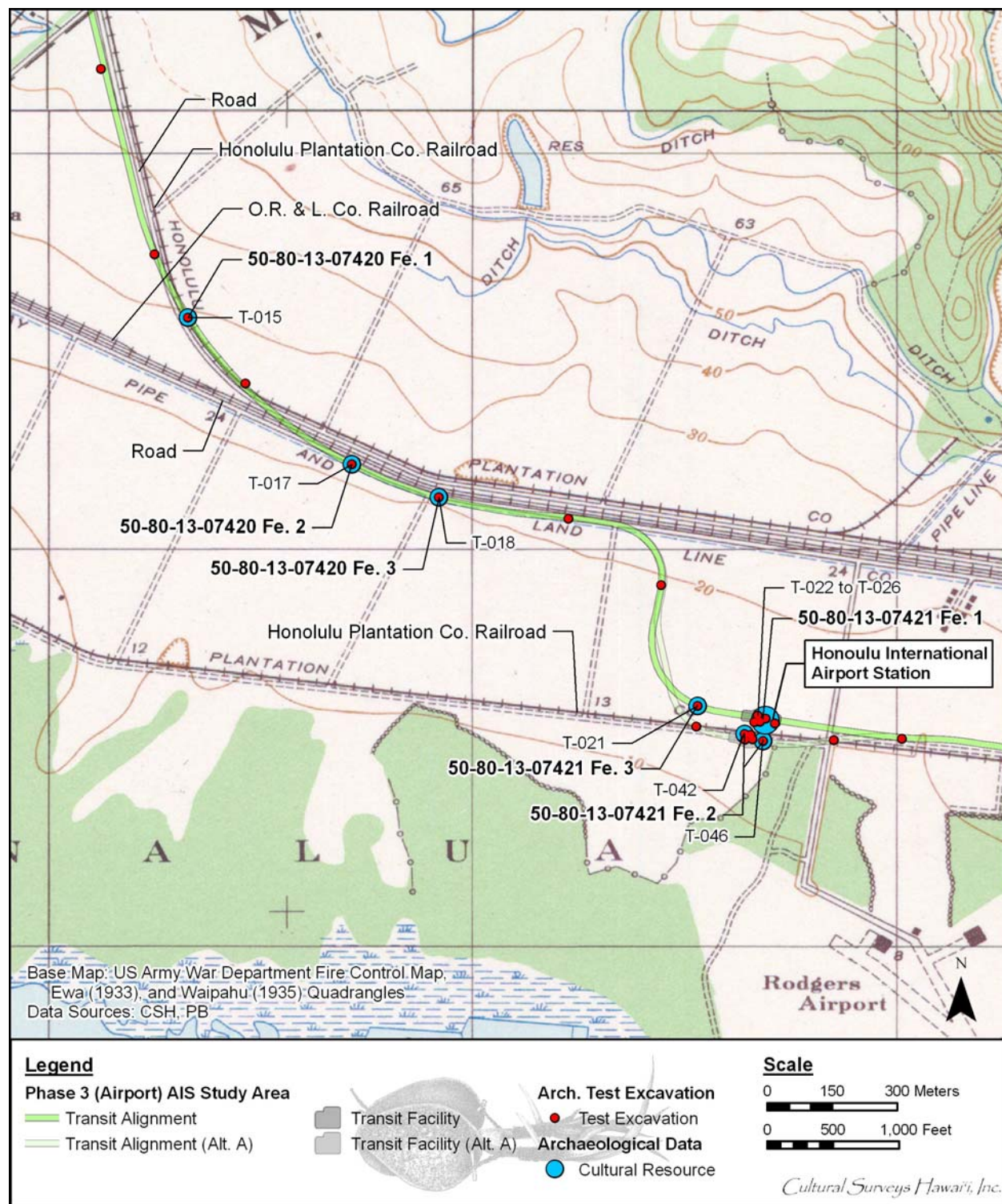


Figure 239. Locations of two archaeological cultural resources identified in the Airport Section of the HHCTCP corridor on 1930s series War Department maps (Note: SIHP 50-80-13-7420 Feature 1 appears to be at the location of a road)

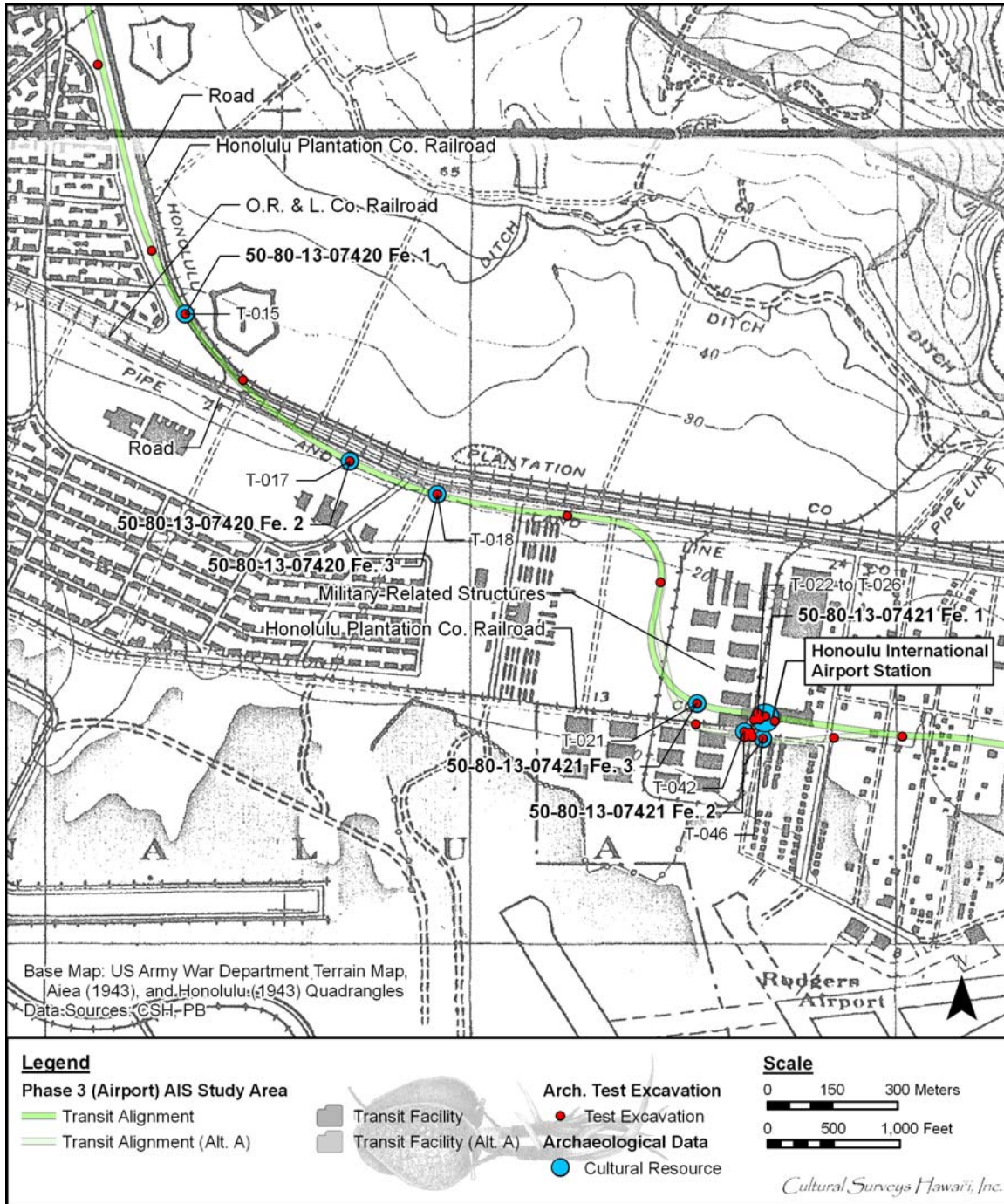


Figure 240. Portion of 1943 map showing warehouse-like structures (SIHP 50-80-13-7421) within a train loop in the vicinity of where a concrete slab was identified; note also SIHP 50-80-13-7420 Feature 1 (where a buried asphalt surface was identified) on Kamehameha Highway and SIHP 50-80-13-7420 Feature 2 that was not a road at that time

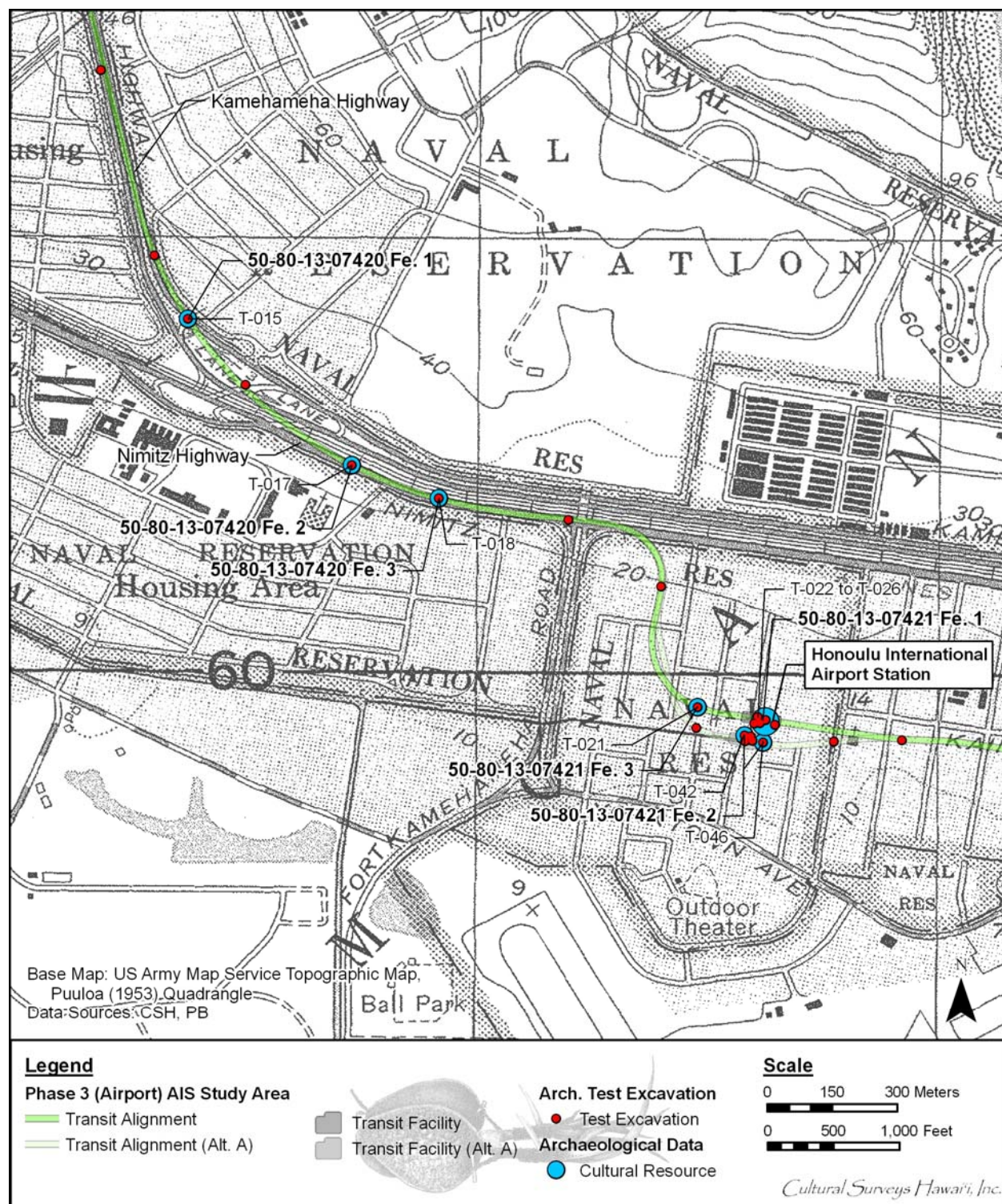


Figure 241. 1953 map showing a road on the *makai* (south) side of the railroad tracks (SIHP 50-80-13-7420 Feature 2) where a buried asphalt surface was identified